Safety Maintenance and Production

EST. 1901 AMERICA'S PIONEER MAGAZINE IN ITS FIELD

FIFTY CENTS JULY, 1954

Aluminized Protective Clothing

Reflects 90% of Radiant Heat!

Weighs Half as much as Regular Asbestos Clothing!

It's AO's New Line of

ALUMINIZED

ASBESTOS

CLOTHING

Here it is . . . the greatest advance in years in hot job *protection* and *comfort* for workers! AO Aluminized Asbestos Clothing* includes Jackets, Furnace Coats, Chaps, Aprons, Spats, Leggings, Sleeves, Hoods and Combination Gloves and Mittens. They offer your workers the heat resistance of asbestos combined with aluminum's ability to reflect over 90% of all radiant heat. The metallized fabric has all the reflecting properties of aluminum foil . . . resists abrasion better than plain asbestos . . . won't peel or crack. Result: Longer life and superior service.

What's more, AO Aluminized Asbestos is far *lighter* than plain asbestos, garment for garment. Stays lighter too, because it does not pick up weight in service to any degree. Molten metal slides off — does not adhere. These products which keep workers *cool* are the "hottest" items in years in safety clothing. Ask your nearest AO Safety Products Representative to show them to you.

RECOMMENDED USES

For protection against high radiant heat, sparks and splashes of molten metal encountered in:

1. Open hearth, blast furnace and electric furnace tapping;
2. Pushing of coke ovens;
3. Cupola pouring in foundries;
4. Exposures at glass tanks (molten glass);
5. Cutting, scarfing, any gas burning of metals;
6. Any other exposures to high radiant heat.

*Available in AO Aluminized Duck except gloves, mittens, short jackets, and split leg aprons.

American Optical
SAFETY PRODUCTS DIVISION

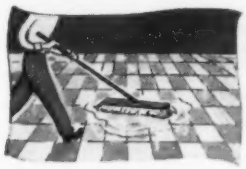
AO SAFETY ZONE

Keep your workers in the Safety Zone with American Optical Safety Equipment.

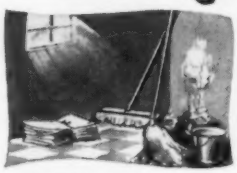
SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES

(For full details, use key # T-1 on free Inquiry Card on page 71)

Why Risk Fire with an Oily Dressing?



Oily dressings with even a high flash point constitute a constant fire hazard in daily use.



Mops and rags saturated with such solutions when stored often cause spontaneous combustion . . .

Presenting an ever dangerous fire threat and possible serious harm to workers and property.

HIL-SWEEP maintains floors the FLAME-PROOF way!

fire tests *PROVE* HIL-SWEEP will NOT BURN

- Rags saturated with Hil-Sweep will not burn or cause spontaneous combustion.
- Eliminates fire hazard in use.
- Safe in storage — Won't freeze at low temperatures. Won't explode at high temperatures.

. . . on your staff,

not your payroll.

AND LOOK AT THESE OTHER HIL-SWEEP ADVANTAGES

- Hil-Sweep is non-injurious to asphalt tile . . . the result of years of research to develop a maintainer that would be safe for daily care of resilient and all other types of floors.
- You can spray it or sprinkle it on brush, mop or dust cloth.
- Contains no emulsified oil—leaves no oily residue to darken, discolor, soften or bleed colors.
- Will not soften wax film or decrease frictional resistance.
- Won't load mop like other floor dressings. After using simply shake out brush or cloth and it's ready to use again. Saves on laundry and dry cleaning bills.
- Leaves floors cleanly fresh and dust-free, then evaporates.
- Imparts a pleasant aroma where used.

Your Hillyard Maintaineer will help you with any Floor Problem

Branches in Principal Cities.

MAIL COUPON TODAY

Hillyard Chemical Co., St. Joseph, Mo.

☐ Please give me full information on Hil-Sweep.

☐ Please have the Hillyard Maintaineer make a Hil-Sweep demonstration on my floors. No charge.

Name.....

Title.....

Institution.....

Address.....

City.....

State.....

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SAFETY GOGGLES | SAFETY SPECTACLES

FORM FITTING COMFORTABLE

WATCHEMOKET eye SAVERS

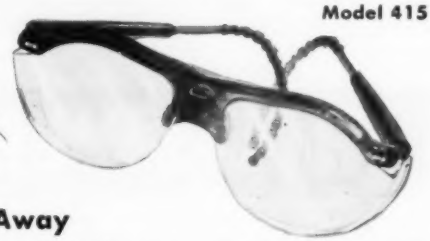
LIGHTWEIGHT EASY TO WEAR

Model 440SV Methacrylate Lens
Model 441SV Acetate Lens

Soft Vinyl Frame

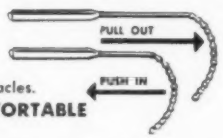
"Stac-Vent" — a new principle in goggle ventilation.
Clearer Vision . . . More Comfort . . . Greater Safety.
Large frame fits comfortably over all prescription glasses.
Lenses optically correct — shatterproof — easily replaced.
Also available with regular or screen ventilation.

Model 415



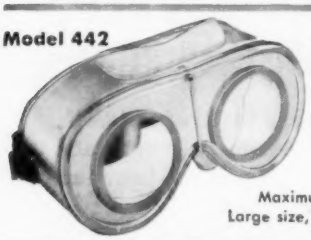
Tuc-Away

Shatterproof, optically correct lenses.
Easily replaced . . . snap-in, snap-out.
In clear, light, medium or dark green.
One size and model fits every worker.
Wearer adjusts and maintains his own spectacles.



WORN BECAUSE THEY ARE COMFORTABLE

Model 442



Soft Vinyl Frame
50 mm Round
Hardened Safety Glass Lenses

Maximum protection where there is extreme abrasion.
Maximum comfort and minimum weight.
Large size, fits over all prescription glasses.

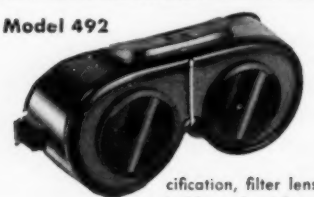
Visor-Tuc

New Over-Eyes Protection

Almost 100% protection, plus all the comfort of "Tuc-Away". "Visor-Tuc" fits snugly against the forehead. Shatterproof Eye Savers lenses interchangeable in Tuc-Away Model.

Model 422

Model 492



Welding Goggle
Opaque Black
Soft Vinyl Frame

Furnished with replaceable 50 mm round, Federal Specification, filter lens shades 3, 4, 5 or 6, protected inside and out by cover lenses.

Split Joint

Model 80

Split Joint Frame makes changing lenses a simple operation, no heating to distort frame. Retrax temple easily adjusted — One size Standard 47 mm drop eye lenses. Removable clip-on side shields available.

Quick, easy replacement of:
PLASTIC SAFETY LENSES
PRESCRIPTION LENSES
PLANO SAFETY GLASS LENSES

Model 99

Cheepee
One-Piece
Goggles

Close fitting, lightweight, comfortable.
Optically correct . . . no distortion.
Available in clear or medium green.

Methaspec Eye Shield

Model 55

Optically correct, one piece, curved Methacrylate Eye Savers Lens provides heavy impact protection.
Lens is .080" thick, available in clear or light, medium and dark green.

For details, see your Authorized Eye Savers Supplier or write direct

Quality Eye Protective Equipment ***Made by the Leaders in Plastics***

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(For full details, use Key # T-3 on free Inquiry Card on page 71)

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SAFETY MAINTENANCE & PRODUCTION

FORMERLY "SAFETY ENGINEERING"
EST. 1901

VOL. 108, NO. 1 **JULY, 1954**

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COVER PICTURE
Protective equipment is needed for mixing powerful insecticides: gas masks, gloves, safety clothing.
Picture by courtesy of Mine Safety Appliances Co.

AMERICA'S PIONEER MAGAZINE IN ITS FIELD

SAFETY MAINTENANCE & PRODUCTION is indexed regularly by Engineering Index, Inc., New York

It's Safe to Say

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★ NEWSPAPER SPOTLIGHTS SAFETY

THE DAILY NEWSPAPERS OF THIS COUNTRY ARE QUICK to throw a spotlight on the dark shadows covering dangers to our citizens. A case in point is the editorial appearing in a recent issue of the *Chicago Daily Tribune*, one of the great journals of America.

In emphasizing the colossal waste and utter futility of accidents, the *Tribune* points-up the splendid accident prevention record being achieved by one of the world's leading insurance companies now building a great skyscraper in the city of Chicago.

According to the *Tribune* the builders had extended the framework a dozen floors into the air without a single fatal or permanently disabling accident. Not too many years ago it seemed to be taken for granted that building a skpscraper cost one life for each story erected.

The safety inspectors on the new job know that a record isn't just luck. Rather it is the result of careful planning for safety, anticipating the multiple causes of accidents and rigidly enforcing rules for preventing those accidents. For example, the *Tribune* editorial reports that every man on the job is required to wear a hard safety helmet. "Six men have been struck by falling objects that probably would have brained them if they had not been so protected."

The safety field is in full agreement with the editorial writer who states that safety records in recent decades have been largely in those fields where the discipline of employment makes people take care of themselves and others. The *Tribune* reminds its vast audience that "once hazardous steel mills now work millions of manhours to each fatality because tough safety directors insist that there is no such thing as an unavoidable accident."

Industry knows full well that providing safe machinery and protective equipment and enforcing safety rules will pay off. Even if the unprofitable careless employee injures only himself, "his compensation and the effect of his accident on insurance rates is costly."

On the other hand, the ordinary motorist will not be fired when he takes a chance endangering his own life or another's. Also, the housewife is under no discipline, the *Tribune* said, except her own common sense often blunted by the harassments of running a home. There is no safety inspector to "blow the whistle on the mother of small children, equally tired and distracted."

★ BENZOL POISONING

THE SLOW AND INSIDIOUS EFFECTS OF INDUSTRIAL poisoning have been emphasized graphically in numerous articles written by medical directors of private industry, government bureaus and insurance companies. In this connection, acute benzol poisoning is classified as compensable generally, and toxicity of this substance requires even more widespread control.

Fortunately, adequate steps to cope with the hazards of benzol poisoning generally are routine throughout industry. Nevertheless, continuous careful study of industrial hazards will result in the use of still more effective measures for their control. This is particularly true in those industries where new processes dictate the use of benzol for which suitable protective devices and equipment are of vital importance. In particular, provision should be made to assure workmen a constant supply of fresh air to combat this poison.

Medical authorities emphasize that benzol may endanger the nervous and respiratory systems and, of course, the blood which is the chief center of attack in chronic cases of benzol poisoning.

Any member of the working staff exposed to the dangers of benzol poisoning should be provided with tested and approved protective devices in order to minimize the dangers of this compensable disease.

In those industries where the use of benzol is incidental, varying amounts of the solvent evaporates into the air resulting in less danger of acute benzol poisoning but a greater chance of contracting the chronic type of poisoning through a long period of exposure to a minor concentration of fumes. In manufacturing plants using benzol as a solvent, greater effort should be made to lessen the exposure and restrict it to isolated areas. Obviously the best treatment of all is the elimination of all solvents found dangerous to health.

It has been determined that benzol is hazardous when there is continuous exposure to more than one hundred parts per million of benzol vapor in the air. Therefore the confinement of processes using benzol to localized areas in the plant is necessary and further, the provision of effective local ventilation at the point of fume production, using downdraft wherever practicable, has been found valuable. In large installations it is economical, as well as much safer, to install a recovery system.

Every effort should be made therefore to provide ventilating arrangements capable of keeping the concentration lower than the point of danger. H. A.

Four reasons why Ansul fire protection equipment is faster _more effective!

1.		**WEATHER-TIGHT CONSTRUCTION.** Ansul extinguishers are water-tight and corrosion resistant, always ready for action even after extreme weathering and exposure to wide temperature variations.
2.		**PATENTED NOZZLE.** To ensure full fire coverage, Ansul's patented nozzles deliver the right kind of stream for your fire protection problem (low velocity or high velocity, depending on hazard).
3.		**SEALED PRESSURE CARTRIDGE.** A positive activating system puts Ansul "Plus Fifty" dry chemical to work immediately—no delay. Cartridge replacement in the field is simple, no tools are necessary.
4.		**RUGGED CONSTRUCTION.** Quality materials and careful workmanship make it possible for Ansul to back their equipment with a 5-year warranty —the only one of its kind in the industry.

Here is the Big Service Plus offered only by Ansul:

A complete fire protection program for your plant and your employees

- Personnel training in your plant by experienced Ansul instructors.
- Customer training school at Ansul plant, Marinette, Wisconsin. Write for schedule and registration information.
- Visual aids for your safety meetings and other training.
- In-plant survey to determine your fire protection needs.

Call the Ansul Man!

Get in touch with your local Ansul man through the "yellow pages" or write ANSUL CHEMICAL COMPANY, Fire Equipment Division, Department F-52, Marinette, Wisconsin.

ANSUL

(For full details, use Key # T-4 on free Inquiry Card on page 71)

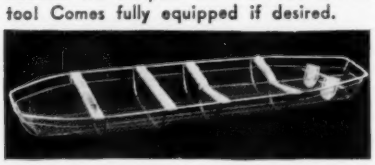
JUNKIN STRETCHERS

STRETCHER CASE

$23.80 FOB Louisville

YOUR PLANT *NEEDS* STRETCHERS

The Junkin Stretcher Case affords a convenient and compact cabinet for storing the army type stretcher, blankets and first aid equipment. It provides a definite location for the equipment and protects it against the deteriorating effects of dirt and grime. And because it's compact it's a SPACE SAVER too! Comes fully equipped if desired.



JUNKIN SPLINT-TYPE STRETCHER

Construction permits patient to be carried horizontally or lifted vertically without danger from inaccessible locations. Canvas straps and footrests keep patient rigid and comfortable. For complete information write for free descriptive literature.

JUNKIN
JUNKIN ENGINEERED SAFETY
SAFETY APPLIANCE CO.
101 S. FLOYD ST.
LOUISVILLE 2, KENTUCKY

(Use Key # T-5 on Inquiry Card on page 71)

Check List of Aids to Production:

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THE FUTURE SHOWS

Los Angeles, Calif. *July 13–15*

First Western Plant Maintenance Show and Conference (Pan Pacific Auditorium). Clapp & Poliak, Inc., Exposition Management, 759 Monadnock Bldg., San Francisco 5, Calif.

Cleveland, Ohio *Sept. 14–16*

Sixteenth Annual Ohio State Safety Conference & Exhibit (Hotel Carter). Carl L. Smith, Executive Secretary, 2073 E. 9th St., Cleveland 15, Ohio.

York Harbor, Maine *Sept. 16–17*

Twenty-seventh Annual Maine State Safety Conference. (Marshall House). A. F. Minchin, Secretary, Industrial Safety Division, Dept. of Labor and Industry, Augusta, Me.

Chicago, Ill. *Oct. 18–22*

Forty-Second Annual National Safety Congress and Exposition (Conrad Hilton Hotel). R. L. Forney, General Secretary, National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

Atlantic City, N. J. *Nov. 6–11*

First Annual Eastern Sanitary Supply Group Trade Show and Convention (Hotel Ambassador). William F. Plowfield, Executive Director, 4 S. 15th St., Philadelphia 2, Pa.

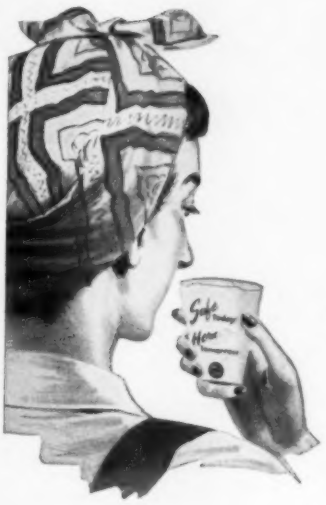
Portland, Oregon *Nov. 18–19*

Governor's Sixth Annual Industrial Safety Conference (Masonic Temple). Leonard A. Weston, Director, Accident Prevention Division, State Industrial Accident Commission, Public Service Bldg., Salem, Oregon.

Chicago, Ill. *Jan. 24–27*

Sixth National Plant Maintenance and Engineering Show (International Amphitheatre). Clapp & Poliak, Inc., Show Management, 341 Madison Ave., New York 17, N. Y.

What is this girl doing?



She's helping reduce your accident rate!

You know that accidents cost money. And fifty percent of all accidents are preventable. You know that safety messages *that get read* do help reduce accidents — the National Safety Council says so. But *how* to get them read . . . ?

Put your safety messages in your worker's hand — on an AJAX or AERO Cup — where he'll see them several times a day, when he's relaxed, receptive, ready to read. (And he'll appreciate the comfort, convenience and complete sanitation of these crisp, clean, easy-to-drink-from paper cups.)

AJAX® Cups — one-piece, wedge-shaped, easy to hold and drink from; in 4, 6, and 7 oz. sizes; packed imprinted with assorted stock safety messages or your own message to order.

AERO® Cups — for those who prefer a flat-bottom cup; in 3, 4, 5 and 6 oz. sizes. Also available imprinted with assorted stock safety messages or your own message to order.

GET THE FULL STORY

Write us today for this new folder which gives full details on imprinted AJAX and AERO Cups and equipment.

IT'S WORTH KNOWING

Medical men agree that drinking sufficient water is necessary to health; drinking too little water can produce sluggishness, fatigue and other harmful effects. Surveys show that people drinking from paper cups drink 60% more water, consume less time doing it.

And AJAX and AERO Cups reduce the danger of transmitted infection, help cut absenteeism and improve worker morale, because they provide complete, sanitary, comfortable drinking water service.

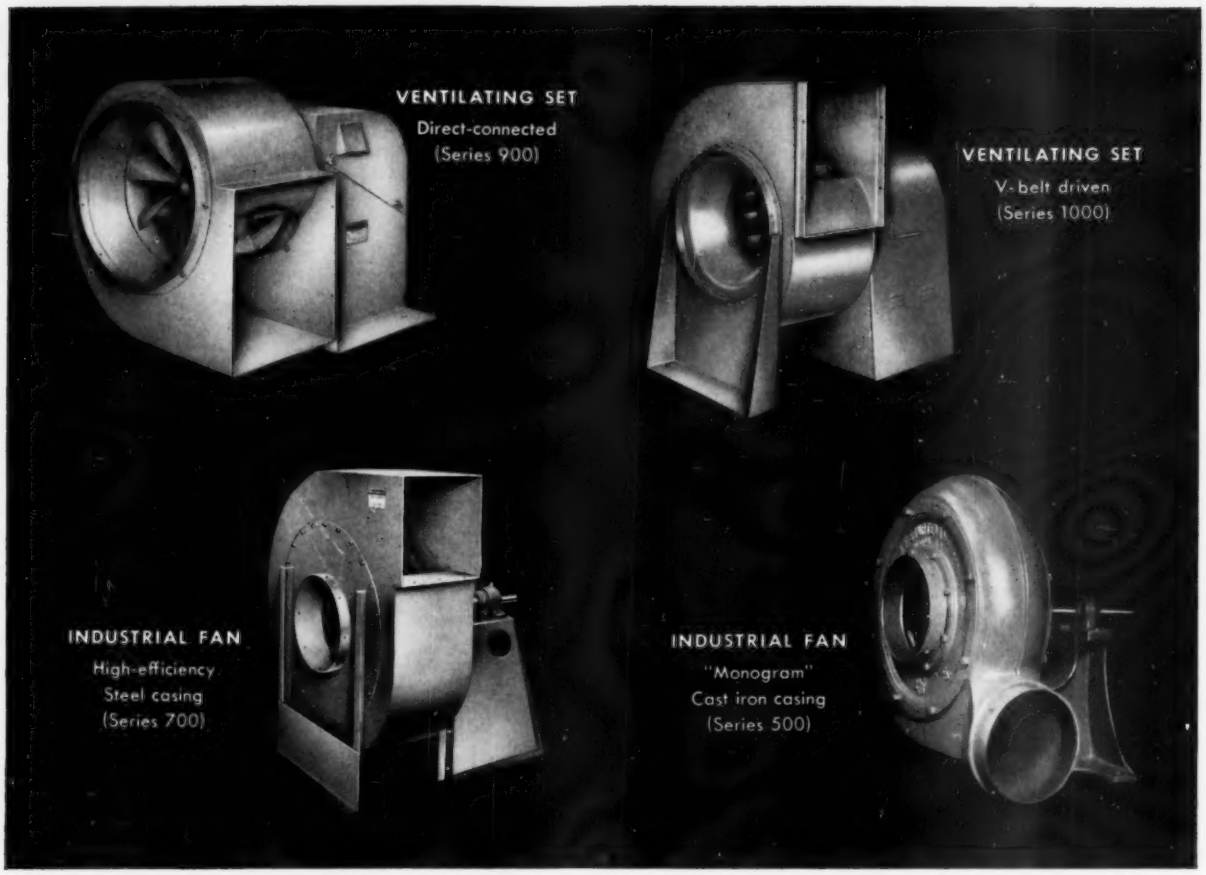
C1-8

United States Envelope Company

General Offices: • Springfield 2, Mass.

15 DIVISIONS FROM COAST TO COAST

(For full details, use Key # T-6 on free Inquiry Card on page 71)



These Westinghouse Fans Help You Increase Production . . . Employee Efficiency

Whatever your air handling problem . . . smoke, fumes, vapor, dust, wood shavings, granular material or ventilating . . . these Westinghouse fans are designed to handle or remove them . . . efficiently and economically.

INDUSTRIAL FANS (SERIES 700) . . . for dust collecting and conveying at high pressure. Wide range of capacities. Three types of wheels in 11 sizes.

1. Air Handling Wheel . . . particularly adaptable for general air handling and exhaust systems in removal of smoke, fumes and gases.

2. Material Handling Wheel . . . designed specifically for grinding and buffing wheel systems, and conveying materials such as chips, sawdust and grains.

3. Long Shaving Wheel . . . handles long fibrous materials that pass through the fan itself: trimmings from corrugated boxes, alfalfa, long shavings from woodworking machinery, rags, others.

INDUSTRIAL FANS (SERIES 500—MONOGRAM) . . . ruggedly built, with cast iron casing. For use as a blower or exhaust or for dust control, collecting and conveying waste or raw materials, supplying air for furnace blast, drying, etc. Provides long, trouble-free service at low cost under severest operating conditions. In 10 sizes with wide range of capacity.

SERIES 900 VENTILATING SETS . . . compact, efficient, direct-connected and ready-to-run. Especially suited for small ventilating installations. Cleanable radial blade wheel design minimizes problem of handling airborne dirt and grease. Six sizes from 6" to 15" wheel diameters.

SERIES 1000 VENTILATING SETS . . . V-belt driven, self-contained. Install indoors or outdoors in a wide variety of heating, ventilating or air conditioning applications. Twelve sizes from 9" to 30" wheel diameters.

These rugged, powerful Westinghouse fans provide the most economical solution to your specific air handling problem. And Westinghouse fans offer a *single equipment warranty* with undivided responsibility . . . an *exclusive* Westinghouse-Sturtevant feature. Get the facts today on the fan built for *your* need from your nearest Westinghouse-Sturtevant office. Or write: Westinghouse Electric Corporation, Sturtevant Division, Hyde Park, Boston 36, Mass.

WESTINGHOUSE AIR HANDLING

J-80380B

YOU CAN BE SURE...IF IT'S Westinghouse

(For full details, use Key # T-7 on free Inquiry Card on page 71)

By EMILE F. DU PONT
Director, Employee Relations Department
E. I. du Pont de Nemours & Company, Inc.
Wilmington, Delaware

SAFETY IS OUR SECRET WEAPON

THE DESIRABILITY OF SAFETY cannot be debated. People argue about politics, or baseball, or economics; but who can argue whether schools should be made safe for children, or whether the traffic death rate should be higher or lower.

Yet, this very fact that safety is not debatable may lead to superficial thinking on the subject. I suppose there are many people who consider the safety question in a detached or abstract way—as something that is good and humanitarian but remote from themselves. Such persons undoubtedly read of mounting traffic accidents with a feeling of horror but as something that could not happen to them. I suppose there are some who think of industrial accidents in terms of injury compensation and time lost from work.

But, there is one vital aspect of the safety movement which is often overlooked. Safety is one of our defensive weapons against Communism.

The United States, for better or worse, has achieved a position of world leadership. There are forces at work which seek to wrest this position from us. Never before in history have we faced such a need to be strong. The threat to our freedom and our way of life is twofold. We could be destroyed by war, or we could be so weakened by economic collapse that we would be vulnerable to our enemies, and our people would turn in despair to some other ideology.

Industrial Collapse

Of the two threats, the second, it seems to me, presents the greatest danger, for our government is spending vast sums to be prepared for war and to discourage any would-be aggressor. The second threat, being more subtle, could overtake us before we became aware of the true situation.

Our experience in World War II proved conclusively that American efficiency in production was a vital factor in the Allied victory. Standing alone with no supporting evidence, this should point conclusively to the necessity for us to be as efficient as we can in our internal economy, and to prevent waste wherever possible.

Enlightened industrial management has learned beyond a doubt that efficiency and safety performance go hand in hand—you cannot have one without the other. Accidents are wasteful, both in human resources and in production. If we are to measure up to our present world responsibilities we must take the proper steps now, and every day, to insure against waste in any segment of our economy.

Now let's examine where we are and where we have come from. The organized safety movement started in 1913. Since then we have seen encouraging progress. The statisticians estimate that if accidental

deaths had continued at the 1913 rate up to the present time, more than half a million more persons would have lost their lives. This improvement is the more remarkable when we consider that it took place during a period which brought the development of fast automobiles and faster airplanes.

The Other Side

Unfortunately, there is another side to the story. While the death rate from accidents in 1953 was 60 per 100,000 population—the lowest on record—we still had a toll in the United States of 95,000 lives and 9,600,000 injuries annually. Traffic accidents alone killed 38,300 persons last year—one and one-half times the number of Americans who died in the Korean War.

The time lost last year by workers from accidents of all kinds was equivalent to an entire year's shutdown of industrial plants employing 1,100,000 men and women, or in other words, removing from production all the plants of General Motors, Ford, Chrysler, and the United States Steel Company.

It is estimated that 1953's accidents cost our economy more than 9 billion dollars, representing nearly a quarter of our budget for national defense. This sum becomes all the more staggering when the magnitude of a billion dollars is brought into more understandable focus. According to Paul Talbot, writing in the United Business Service recently, 1 million dollars is a stack of new 1 thousand dollar bills 8 inches high. However, a billion dollars is a much different story. To provide this sum in new 1 thousand dollar bills, the stack would be piled as high as the Washington Monument and would reach into the sky for 1 hundred more feet.

We simply cannot afford such an appalling waste of manpower and resources if we are to maintain our strength and preserve our position of world leadership.

I have said earlier that safety and efficiency go hand in hand. I know this to be true. The mutuality of interest in safety on the part of management and workmen does much to build up a spirit of teamwork, which is so important to the success of any business. It contributes to confidence and common purpose among all ranks of employees, factors so vital to American industry today.

Where Do Accidents Occur?

Now let us take a closer look at where business actually stands in relation to its safety performance. Available statistics show that two-thirds of all industrial injuries occur in businesses with fewer than 100 workers. The accident frequency rate is more than double that of the larger companies.

I doubt whether these facts are widely understood by small business managements. The employer of a 25-man shop is likely to feel pretty good if he gets through the year with only one time-losing injury. What he fails to realize is that the equivalent safety performance in a plant employing 5,000 workers would mean 200 time-losing injuries.

As a result, small business, directly or indirectly, pays most of the estimated 3 billion dollar annual cost of occupational injuries, and its workers and their families suffer most of the consequences of the 15 thousand occupational deaths and the 2 million occupational injuries. In addition to these tangible costs, the effect upon employee morale must be considerable.

The irony of the situation lies in the fact that there is nothing in the operation of the small shops to make them more dangerous than large plants. For many years I have had the opportunity of watching at close range a safety program which has achieved considerable success in an industry that is not without its hazards. In 1953 we operated 102 plants and laboratories. Seventy of these had no time-losing injuries, and 20 of the 70 had fewer than 100 employees. Of the 32 which had time-losing injuries, only 3 had fewer than 100 employees. This experience seems to refute the belief that small plants breed accidents.

(Continued on page 35)

"But, comrade, if we're so super, how is it we don't have Safety and good maintenance like U.S.A.?"

STARVING CORROSION TO DEATH

Brine tank receives a rubber lining which, welded to metal, will withstand the corrosive action of the strongest acids.

THE crippling effects of corrosion and abrasion, once a plague to the industrial machine, are no longer eating freely into profits and stopping production schedules. By using bonded rubber linings, failure of equipment and repair "shutdowns" due to the disintegration of metals, is being greatly reduced.

Rubber Sheet Lining

Eating away of steel surfaces has been stopped by a "rubber sheet" lining installed in such units as railroad tank cars, agitators in mixing units, fans and fan housings, pickling tubs, chemical processing tanks, and continuous vacuum filters.

The lining is applicable to all shapes and sizes of tanks, castings, and welded equipment. It can effectively seal against most corrosive liquids, it will not slough off, and it will not crack or buckle under alternate drying and wetting. Corrosion has been successfully eliminated in such special equipment projects as waste acid disposal systems, chemical settling tanks, submarine battery compartments, ore refining operations and many other types of complex units.

The usual thickness of lining is three-sixteenths of an inch, of nonporous sheet capable of protecting steel against the strongest acids. Units such as tumbling barrels which contain abrasives to smooth and polish rough edges of metal parts require linings as much as one-half to 1 inch in thickness. Lining for the interior of storage tanks quite often consumes as much as 6 tons of rubber compound. One tank alone, with a 420 thousand-gallon capacity, used approximately 11 thousand pounds of the special rubber. In one order which required protection for 24 barge tanks, 30 tons of lining were installed.

Transport Problem

Often the size of the units creates a transportation problem. One chemical company, which ordered seven 31-foot storage tanks, had them fabricated some distance from the plant grounds. Too large for a railroad flat car or truck the tanks were finally loaded on barges and pulled down the Allegheny River to the company grounds. There have been cases when tanks, too large for even the immense river barges, have been pumped full of air and floated to an installation.

No Job Too Big

Recently 6 huge chemical storage bottles were lined in a shipyard under sub-zero weather conditions. The bottles, with a 240 thousand-gallon capacity, were already installed in the hold of a large marine tank ship when the lining was applied. To vulcanize the rubber, steam was introduced under pressure, with the bottles themselves acting as heat containers.

Hydraulic engineers, using steel pipes to clear the river bottom in the channels and shipping lanes of the Mississippi River, found that the pipes, unprotected against the sharp particles of sand, rocks and debris, were developing "sore throats" and wearing through in a short time. After rubber linings were installed, more than 30 million cubic yards of material were sucked from the river bottom without serious pipe failure.

Picture by courtesy of Goodyear Tire & Rubber Co.

If you want a safe ladder or scaffold

GIVE THE WOOD A GOOD LOOK!

By L. J. MARKWARDT
Assistant Director
Forest Products Laboratory
U. S. Dept. of Agriculture
Madison, Wisconsin

WOOD LADDERS ARE PRONE TO be taken too much for granted, both with respect to the need of inspection and maintenance, and the observance of safety requirements in use. As a result, we continue to have ladder accidents resulting from carelessness, neglect, or lack of appreciation of the hazards.

Safety begins with the responsibility of the manufacturer to furnish a well-manufactured ladder made of carefully inspected material and of proper design. To the user or owner falls the responsibility of choosing the right ladder for the job, of providing continued inspection and maintenance, and above all, of observing safety precautions in use.

It is my purpose to discuss the inspection of ladder material, as one link in the chain of ladder safety requirements.

Why Wood For Ladders?

Among the characteristics of wood that enable it to serve so satisfactorily for ladders are high strength; relatively light weight; ease of fabrication, maintenance and repair; facility of inspection; and low electrical and thermal conductivity. Ladders are made of any of a number of species of wood; the parts usually are a single-piece material.

Because of recent significant developments in glues and gluing techniques, we may in the future expect to see more wood ladders made of glued laminated construction. By this method, structural members, such as side rails of any desired size, may be fabricated from smaller pieces, just as are laminated arches for buildings or railway bridge timbers; also, different species of wood may be combined, to afford even better strength-weight efficiency.

The basic principles of wood inspection are applicable to laminated material as well as to ladders of one-piece members. Inspection need not be difficult or complicated. Each piece of wood in reality is an open book, merely requiring a knowledge of its composition and structure and how to recognize and limit certain natural characteristics and defects to assure the selection of satisfactory stock for ladder purposes.

On the other hand, the importance of such selection should not be underestimated, nor should the possible use of special techniques that afford more efficient and thorough inspection be overlooked. As a background for proper inspection methods, let us examine the structure of wood and some of its characteristics.

Wood—Structure and Character

WOOD FORMATION. Wood is an organic material—a renewable resource—the product of the living tree. For the production of wood, nature invented chlorophyll; which, actuated by the energy of sunlight, manufactures sugar out of carbon dioxide gas and water. The green leaves, by the process of photosynthesis, break up the CO_2 molecule, giving back oxygen to the air. They combine carbon with water and other minerals conveyed from the root system to form sugar, starch, cellulose, and other food products. These new compounds of photosynthesis flow downward to the growing parts through the inner bark, and presumably also through the sapwood to form cells.

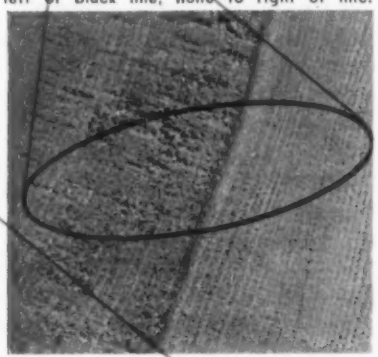
A tree thus grows by the formation of new cells—myriads of new cells—under the bark and at the tips of the branches and roots. The growing region just under the bark is known as the cambium. As the cambium cells divide they diversify, some developing on the inner side to form wood elements, and others on the outer side to form bark elements. The cambium is hence the basic zone of tree growth. Year by year, growth thus consists of adding a new and complete layer or envelope over the entire tree structure, the thickness of the growth layer depending on the growth conditions, the species, and many other factors.

CELL STRUCTURE AND COMPOSITION. There are principally 3 kinds of cells, namely wood fibers, vessels or pores, and storage cells which are technically called parenchyma. The wood fibers, which are the most common cells in wood, are oriented longitudinally in the tree and give wood its

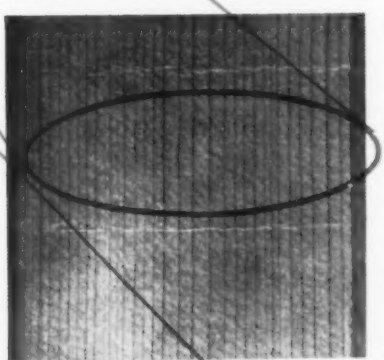
LADDER & SCAFFOLD SERIES
other articles in June and August

Reflector spotlight and incandescent bulb in desk lamp are placed to detect compression failures and fiber breakage in ladder rail. Note lacquer brush for spotting certain areas for closer inspection of wood.

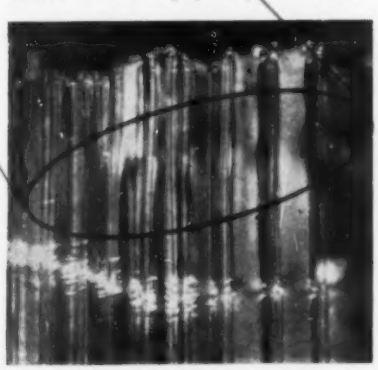
End-grain surface shows fiber breakage on left of black line, none to right of line.



Cross-grain lines are compression failures.



Light zones across fibers are compression failures in this highly magnified section.



great strength. They consist of essentially narrow tubes closed at both ends and in softwoods are about one-seventh inch long and about one one-hundredth as wide as they are long; in hard-woods the fibers are on the average much shorter. The length of the fibers, however, does not bear a definite relation to the strength of the wood. For example, the fibers of shag-bark hickory, noted for its high strength and toughness, are much shorter than those of black tupelo, which is inferior to hickory in its mechanical properties.

Fiber Bond Strong

The bond between the fibers, regardless of their length, is exceedingly strong and does not constitute a principal source of weakness, as evidenced by the fact that the fibers of wood tested in tension do not commonly separate from one another but are torn. The vessels, present only in hardwoods, are shorter and wider than the fibers. They are open at the ends and form long tubes or pores through which the water absorbed by the roots is conducted to maintain the life processes of the trees. In the soft-woods, the fibers conduct sap. The parenchyma cells in wood are short in length, somewhat rectangular in cross section, and close at the ends. They store food materials.

MICROSTRUCTURE. The cell walls are made up of concentric layers—a primary, a secondary, and sometimes a tertiary layer. The primary layer is the modified membrane of the original cell. The secondary layer is divided into a series of sleeves, varying in number from 8 to 12. The layers of the cell wall may be dissected into long slender fibrils. The fibrils are arranged spirally, and are the smallest unit that becomes evident through any simple mechanical disintegration. The orientation of the fibrils, particularly in the secondary layer, affects the important properties of strength and shrinkage in wood.

In typical wood fibers, such as are associated with good strength properties, the fibrils are spiraled at only small angles to the axis of the fiber. On the other hand, large fibril angles are associated with poor strength and with appreciable longitudinal shrinkage that causes serious warping. The submicroscopical structure of the fibrils is comprised of units of glucose molecules that make up the strands of cellulose, which are about 2-millionths of an inch in diameter.

Chemical Composition

From the standpoint of chemical composition, the wood fibers are composed of cellulose cemented with a complex substance called lignin. Roughly, cellulose comprises about 60 percent of wood substance, lignin 28 percent, and sugars and ex-

tractives the remaining 12 percent.

ANNUAL RINGS. In climates where temperatures limit tree growth to the summer months, each year's growth increment is usually readily distinguishable and is called an annual ring. In tropical climates growth is more or less continuous, and concentric demarcations occur as a result of fluctuations in growth activity. Such demarcations, however, should not be confused with the annual rings.

SPRINGWOOD AND SUMMERWOOD. In many woods, cells formed in the spring, when tree growth is most active, are comparatively large and thin-walled, while those formed later in the year are smaller and relatively thick-walled. The early cells constitute the springwood and the later ones the summer-wood; together they comprise one annual ring. Obviously, the thin-walled cells are weaker than the thick-walled cells. Summerwood is therefore, in general, denser and stronger than springwood. In woods that exhibit a marked contrast in springwood and summerwood, such as Douglas fir and southern yellow pine, the proportion of summerwood offers a visual basis for estimating density and strength.

SAPWOOD AND HEARTWOOD. In the tree, certain wood elements function as living cells for a time, but eventually become inactive. As the tree gets older and bigger, more and more of the cells from the pith outward cease to function other than as mechanical support. This inner, and usually darker colored, portion of the tree is called the heartwood. The other layers of growth, which contain the only living elements of the wood, are called sapwood. The sapwood is light in color and varies greatly in thickness among different species, among individual trees of the same species, and even among different portions of a tree.

There is a popular misconception that sapwood is stronger than heartwood, particularly in such woods as hickory. However, the change from sapwood to heartwood during the growth of the tree does not result in significant changes in strength, so that there should be no discrimination, with regard to the color of the wood, in the selection of ladder stock. The density of the wood, regardless of whether sapwood or heartwood, is the best basis of selection for strength.

Hardwood and Softwood Strength

HARDWOODS AND SOFTWOODS. The terms "hardwood" and "softwood" are often confusing to those not familiar with the lumber industry. Instead of indicating the hardness or softness of wood, these terms are simply popular descriptive names in use for two great groups, botanically known as angiosperms and gymnosperms, but more popularly as "trees with broad leaves" and as "conifers." Although the terms "hardwoods" and "softwoods" are the most generally accepted popular names for the two classes of trees, they are the most misleading. Oak, birch, and basswood are common "hardwood" species, while longleaf pine, spruce and cypress are "softwoods." While it is true that many "hardwoods," such as oak, are really hard, others, such as basswood, are softer than many "softwoods" (conifers); in fact, balsa, one of the softest woods in the world, is a broad-leaved species, and falls in the so-called "hardwood" group.

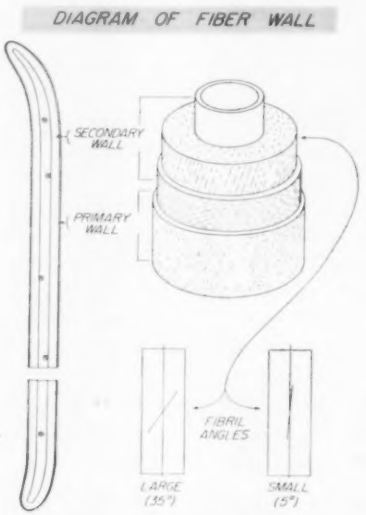


Diagram of a typical wood fiber showing variations in fibril angles in cell wall.

DENSITY IN RELATION TO STRENGTH. Variability is common to all materials, but materials differ considerably in the amount of variation. The growing tree is subject to numerous changing influences that affect the wood produced, and it is not surprising that the clear wood of any species varies in density and strength. It should be noted that the density of wood substance itself, regardless of species, is practically constant. The obvious reason that some species of wood are heavier than others, and that within a species some pieces are heavier than others, is that they contain more wood substance—thicker cell walls and smaller cell spaces.

Thus, since the denser pieces of wood contain the most wood substance, it is to be expected that the density is an index to the strength properties. For purposes involving high strength requirements it is therefore desirable that low-density pieces of a species be excluded in inspection.

MOISTURE CONTENTS—Lumber as it comes from the saw contains a considerable amount of moisture that must be removed before the wood is suitable for the manufacture of ladders.

The moisture in green wood is in part held by the cell walls and in part within the cell cavities, much in the same manner as water is held in a container. As wood dries, the cell walls do not give off moisture until the adjacent cavities are emptied. The condition in which cell walls are fully saturated and the cell cavities emptied is known as the fiber saturation point. It varies from 25 to 35 percent moisture content based on the oven dry weight of the wood.

Increase in strength begins when the cell walls begin to lose moisture; that is, after the wood is dried to below the fiber saturation point. From this point on, most strength properties increase rapidly as drying progresses.

Shrinkage across the grain also results when wood dries below the fiber saturation point, and conversely, swelling occurs when dry or

partially dry wood is soaked or when it takes on moisture from the air. Shrinking and swelling in the direction of the grain of normal wood is only a small fraction of 1 percent from the green to the oven dry condition and is of little practical importance in most species of wood.

In the seasoning of wood, checks sometimes develop on the surface. The effect of checks is related mainly to the reduction of shearing strength and to appearance. Small surface checks are not serious from the strength standpoint.

Wood defects are set by the American Standard Safety Code for Portable Wood Ladders as irregularities in wood that lower the durability, strength, and utility of ladders. The restrictions on such natural characteristics coincide with their effects on the strength properties. Inspection of ladders and ladder material is made by visual examination, facilitated in some instances by special tools or techniques. Some characteristics, such as knots and checks, can be readily seen and evaluated in accordance with the limits of sizes and locations specified for ladder stock. On the other hand, such defects as cross grain require more careful inspection, but their presence is indicated by certain visible characteristics of the wood when it is examined under suitable conditions.

The complete tabulation of characteristics (see *this page*) may look formidable, but in actual practice it is on only a few features that especially close and critical inspection is required. Manufacturing control includes as routine the meeting of requirements for dimensions, seasoning, and quality of workmanship; the exclusion of material containing wane, shakes, insect damage, and decay, and inspection with respect to limitation in size of permissible characteristics. Actually, the lumber grades under which ladder stock is purchased from the lumber producer limit or exclude many of these features.

The only characteristics requiring special inspection are compression wood, compression failures, and cross grain. However, in addition to a detailed discussion of procedures and techniques, let's mention briefly decay, density, and knots.

DECAY. Decay in wood is produced by plant organisms known as fungi, which live on wood substance. Wood-destroying fungi require favorable conditions for their development with respect to moisture, temperature, and air; hence if any one of these requirements is eliminated, the growth of fungi will be inhibited. *Wood that is kept dry will not decay.*

Keep These Flaws Out of Ladders!

1. DECAY—Disintegration of wood substance due to action of wood-destroying fungi. Also known as dote and rot.
2. WANE—Bark, or the lack of wood from any cause, on the corner of a piece.
3. HONEYCOMBING—Checks, often not visible at the surface, that occur in the interior of a piece, usually along the wood rays.
4. INSECT DAMAGE—Insect damage consists of holes made by borers, generally classified as pin holes, grub holes, and powderpost beetle holes.
5. SHAKE—A separation along the grain, the greater part of which occurs between the rings of annual growth.
6. COMPRESSION WOOD—An abnormal growth occurring in soft-woods is characterized by relatively wide annual rings, usually eccentric, and a comparatively large proportion of summerwood which merges into the springwood without exhibiting a marked contrast in color.
7. COMPRESSION FAILURE—A deformation of the fibers due to excessive compression along the grain. This deformation takes the form of buckling of the fibers.

Check These Characteristics!

1. DENSITY—The mass of a body per unit volume. It is an index of the amount of wood substance present in a piece, and hence an index of strength.
2. CHECK—A lengthwise separation of the wood, most of which occurs across the annual growth layers.
3. PITCH POCKET—A well-defined opening between rings of annual growth, which usually contains, or has contained, more or less pitch, either solid or liquid. Bark may also be present in the pocket.
4. KNOT—A branch or limb, embedded in the tree and cut through in the process of lumber manufacture; classified according to size, quality, and occurrence. For ladders, the size of the knot is determined as the average diameter on the surface of the piece.
5. CROSS GRAIN (Slope of grain)—A deviation in direction of the wood fibers from a line parallel to the sides of the piece. Cross grain may be diagonal, or spiral, or both. Cross grain is limited in terms of its slope, which is established as the distance along the sides of the piece in which a deviation of grain of 1 inch occurs. For example, cross grain with a slope of 1 in 12 means that in a distance of 12 inches, the grain deviates 1 inch from the edge of the piece. The slope of grain is measured over a distance that will assure the determination of the general slope of the grain not influenced by short local deviations.

Different wood-destroying fungi affect wood differently. However, the presence of incipient or advanced decay can usually be readily detected by the presence of discoloration or by an easily recognized pitting of the wood. No method is known for estimating from the appearance of decayed wood the amount of reduction in strength. Consequently, in ladders where strength is an important consideration, any ladder material containing either incipient or advanced decay should be rejected.

Molds and staining fungi are usually not critical with respect to their effect on strength as compared with decay organisms. However, conditions that favor the development of molds and stains are also ideal for the growth of wood-destroying fungi. Since decay even in early stages may greatly reduce some strength properties, stained lumber should generally be excluded for ladder use.

Density—Strength Guide

DENSITY. Low-density wood is defined as that which is exceptionally light in weight for its species. Pieces of lumber with appreciably less than average density, or specific gravity, are inferior in strength properties to denser pieces of the same species. Therefore, ladder specifications require that exceptionally low-density wood be rejected.

In the ordinary handling of lumber, low-density pieces frequently are detected by their lighter weight as compared with other pieces of the same size and moisture content. Unusually lightweight ladder rungs, for example, sometimes can be detected during preparation, or inspection for other defects. Within practical size and moisture content limitations for such finished pieces, it is considered reasonable to establish minimum weights which can be obtained on rapidly weighing scales, particularly for pieces that have the general appearance and feel of exceptionally lightweight material.

Rate of growth, though not an infallible guide, is nevertheless helpful in inspection for density. It is

generally recognized in softwood species that exceptionally low density is associated with extremely wide annual rings, particularly if the summerwood shows a thin line at the outer boundary of the rings. In general, specific gravity of the wood is directly related to the proportion of summerwood and, therefore is a basis for detecting low density in softwood species.

On the other hand, rapid growth in hardwoods, as indicated by wide annual rings, is most frequently associated with denser material. As a general guide, material of moderate growth rate in the softwoods is to be preferred from the strength standpoint, with more critical inspection for density of exceptionally fast or exceptionally slow growth material. In the hardwoods, on the other hand, material of medium and rapid growth rate is generally indicative of higher density, and exceptionally slow growth material should be most closely inspected for density.

Knots—How Important?

KNOTS. Knots are seldom a serious problem in ladder inspection. In ladder stock, knots are readily visible. Their effect on strength is well established, and they can be easily limited in accordance with specification requirements. Knots are most serious when located at the center of the length of side rails or steps, and when near the upper or lower edges of the rail. Knots are limited on the basis of their average diameter as measured on the face.

The holes for ladder rungs, being at the center of the side rails, do not greatly affect strength. A knot of the same diameter similarly placed would be even less detrimental, because of the continuity of the grain around it. Knots seldom if ever have been found to contribute to ladder failures.

CROSS GRAIN. Cross grain, or lack of parallelism between the fiber direction of the wood and the axis of the piece, may seriously detract from the strength of a ladder part if the slope of the cross grain is steep.

Specifications usually impose certain limitations, such as 1 in 12 or 1 in 15, on the general slope of grain, disregarding small local deviations. Where the local deviations of grain occupy but a small proportion of the cross section, their effect on strength may be small. In parts of small dimension, such as a step, however, the local deviation may extend entirely through the thickness of the part. In such a case, the part may be seriously weakened, even though the cross grain extends over only a small portion of the length.

Kinds of Cross Grain

Because determination of slope of grain in lumber is complicated by positions of the annual rings with respect to the surface, it is necessary to recognize the several kinds of cross grain as well as the characteristics by which cross grain can be detected. Cross grain may be of 3 fundamentally different types, spiral grain, diagonal grain, and irregular grain.

The latter comprises various types of wavy, interlocked, and curved grain. Spiral grain results from a curved or spiral rather than vertical arrangement of fibers in the tree. Spiral grain refers to the direction of the fibres within the annual growth layers, and its true direction is evident only on a plain or flat-sawed surface. Interlocked grain is a special form of spiral grain, varying or reversing in slope between successive growth. Diagonal grain is the deviation caused when the lumber is sawed at an angle rather than parallel to the growth layers, either because of crooked logs, carelessness in manufacture, or the practice of sawing parallel to the pitch rather than parallel to the bark in logs of large taper. Diagonal grain shows on the edge-grain or quartersawed face of a board. Irregular grain applies to more or less irregular wood structure, usually accompanying knots or occasionally a series of waves in otherwise clear wood. These are usually localized deviations of grain as compared to the possible prevalence of spiral and diagonal grain throughout the piece.

The simplest method for determining the presence of cross grain of any form is by splitting a piece 4 inches or longer, both tangentially and radially. If cross grain is present, the splits will not be parallel to the edges of the piece. Although this method, of course, cannot be employed in inspecting finished products, such as ladders; the presence of cross grain in ladder stock can be detected by certain characteristics through careful visual examination. The directions of spiral grain on tangential surfaces frequently are indicated by positions of lines of pores, resin ducts, pitch pockets, and seasoning checks with respect to the edges of a piece. Scribe marks and the application of ink or dyes to smooth surfaces also indicate the slopes of spiral grain, since both the scratches and dyes tend to follow the longitudinal direction of the fibers of the wood. Spiral grain frequently is indicated by chipped radial surfaces which have been planed against the grain; in fact, chipped surfaces always are reason to suspect cross grain in a piece of lumber.

Diagonal Grain Detection

Slopes of diagonal grain usually are seen readily by the position of the annual rings with respect to the edges of radial or quartersawed surfaces of lumber. Diagonal grain is indicated also by frequent intersection of the annual rings with tangential surfaces of lumber. In woods in which the annual rings are not distinct, diagonal grain is indicated by lines of pores and mineral streaks or other differences in color which follow the general fiber directions in the wood. In the porous hardwoods, the so-called "short grain" is reason to suspect cross grain; that is, short pores, one-eighth to one-fifth of an inch long in contrast to two-thirds of an inch or more, are indications that the surface was cut across the fiber direction rather than approximately parallel to it.

The problems involved in the detection of cross grain are extremely complicated and therefore require good understanding of the visible characteristics that indicate cross grain. An inspector should look for

(Continued on page 45)

Greater Chicago Safety Meeting Features Awards

Safety Exhibit at Sherman Hotel

ONE OF THE HIGHLIGHTS OF THE 31st Annual Safety Conference and Exposition sponsored by the Greater Chicago Safety Council on May 13 and 14 at the Sherman Hotel in Chicago was the awarding of bronze plaques at the annual banquet session of the Conference to 78 Chicago firms for safety in operation.

Dr. Charles E. Irvin, Director, School of Speech, Michigan State College, East Lansing, was the guest speaker at the dinner. John J. Ahern, director, Department of Fire Protection and Engineering, Illinois Institute of Technology, is president of the Greater Chicago Safety Council.

Sessions dealing with all phases of safety in industry were held during the 2-day meeting. A comprehensive Exposition of safety products, devices and equipment occupied the entire mezzanine floor of the internationally known Sherman Hotel.

J. D. Gallagher, Assistant Superintendent, Engineering Department, Hartford Accident and Indemnity Company, Chicago, in speaking on the subject "Does Safety Reduce Overhead Costs" stated, "Many small plant operators do not feel that there is any particular relationship between accidents that cause injuries and their overhead operating costs. Anyone making a detailed study of this subject would know that the employee injury cost is not the only cost resulting from an accident; that management must often assume various 'hidden' or 'indirect' accident costs as a part of their overhead; and that these uninsured costs are often considerably greater than the injury cost. Extensive studies of these indirect accident costs have been found to average four times as much as the compensation and medical payments. This means, on the average, that for every dollar the insurance company pays out for compensation or medical expense, there is an indirect uninsured cost of $4.00 to management.

"The matter of safety in production can be accomplished only through the attention of management to eliminating accident-producing factors in their operations; and management should be interested in accident prevention not only from the humanitarian standpoint or the standpoint of reducing the injury costs which are paid by the Compensation carrier, but more importantly, from the standpoint of management's own self-interest in reducing these indirect accident costs."

Construction Safety Often Neglected

"Does Safety Pay" was discussed by C. V. Quiett, Secretary, Felmley-Dickerson Company, Bloomington, Illinois, to the construction safety men. "I personally feel that organized safety work in the construction industry has been neglected. Because of the many diversified activities on large construction projects, the constantly changing personnel, the temporary set-up during progress of the work, the constant changes in location, it is most difficult to pin down a definite dangerous working practice, and just as difficult to install an over-all program that will work satisfactorily on every project," Mr. Quiett stated.

"In our attempts to work out our own plan of attack, we have thus uncovered two outstanding facts:

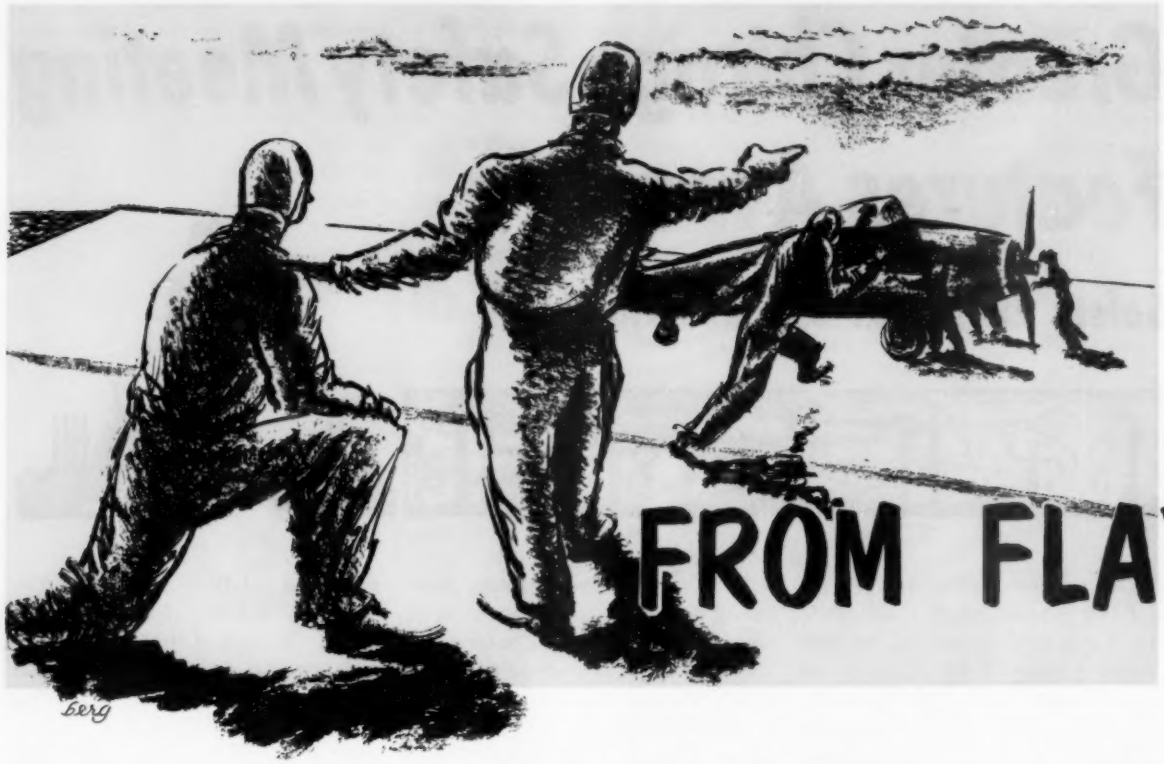
Any plan must be continuous, intensive and flexible.

New ideas must be constantly sought for so that employees' interest will be kept alive."

Training Advances Safety

J. F. Koridek of Western Electric Company, Hawthorne Station, told the safety engineers gathered that training insures profitable safety. "It is interesting to me, as I look over the history of safety activity in industry, that usually the first approach made in attempting to improve accident performance is along materialistic lines. When a problem arises, we approach it by creating accident committees, memoranda, bulletins, suggestions. Sometimes, we even suggest rebuilding our buildings.

(Continued on page 20)



IN CHEMICAL PLANTS AND REFINeries, machine shops and mines, paper mills and laundries—anywhere that floors are wet or slippery—workmen may enjoy the safety of a new anti-slip sole tread now available on a variety of boots and shoes. It is the same tread the Navy has adopted for working on the wet, oily flight decks of aircraft carriers.* A patented design of multiple concentric circles molded in neoprene rubber, the tread grips with a squeegee action and provides excellent traction on wet, icy, or oily surfaces.

Developed for Navy

The tread was developed for the Navy by Al Fellman, a lifelong shoe merchandiser who became intrigued during the war by the Navy's highly specialized footwear needs. As a consultant for the Navy he developed, among other boots and shoes, a submarine sandal, an "abandon ship" boot, the standard flight deck boot, and the anti-slip tread which is now available to civilian markets.

The Navy has adopted the tread as standard and used it on more than a million pairs of flight deck boots and overshoes. The flight deck boot is "Issued to all personnel engaged in handling aircraft aboard carriers," says a former admiral, "and has served a most important purpose and demonstrated its utility and value under severe operating conditions. The non-slip characteristics of the sole provide positive traction, thereby accelerating the moving and servicing of airplanes and lessening leg fatigue of personnel performing these duties."

Boots—"Satisfactory"

The standard Navy flight deck boots and overshoes are already available. A stevedore who tried the boots says they made his job "much easier and safer" when loading freight on wet or icy ramps. And after testing the overshoes a dairy reports they "provided the most satisfactory footing of anything used in the rubber class." The soles are durable, too, and will stand up wherever the job takes them—on a hot tin roof, in grease and oil in a garage, or in solvents and chemicals in an industrial plant.

The same sole is also available now on conventional workshoes, both high tops and oxfords, and on some rugged fleece-lined oxfords and boots that are ideal for a cold footed truck driver or for climbing around an icy construction job. In a few months the sole will appear on galoshes, rubber boots, and on thermoboots that are reported to keep feet warm down to 40 degrees below zero.

Indicative of the sole's non-skid quality is its popularity in two recreational fields, yachting and curling. Yachtsmen find the soles "hold like glue on even the wettest deck or cabin top." And they "grip excellently on ice" say those who use them for curling, the game played by sliding a heavy stone across a frozen rink.

Development Difficult

The development of the sole's design was a long and difficult one. It began when Mr. Fellman heard of an accident aboard a Navy carrier in 1938, in which a flier slipped on the deck and fell into a spinning propellor which severed his arm.

Learning of the accident, Mr. Fellman decided that a shoe must

* The names of manufacturers of the shoe sole and the shoes or boots having the sole may be obtained on inquiry to the Editor.

Original all-weather boot for Navy Carriers is now available for oily and wet industrial jobs.

- TOP TO INDUSTRY

be made to prevent the recurrence of this kind of accident. In cooperation with the Navy's Bureau of Aeronautics he began tests on existing soles and discovered the need for a new sole design was essential. After much experimenting he created the rings within rings sole.

First Pairs Ordered

After official tests by the Navy, 180 pairs were ordered. The shoes were so well liked that they became standard issue. Mr. Fellman continued refinements in the shoes themselves, making them of tougher leather, and providing them with only two eyelets for quick lacing.

The remaining problem was the fact that the sole was wearing out too fast. The design was successful but the material wasn't. With the development of chemically made substitutes for rubber, it became possible to make soles that would hold up under attack by oil and fuel. Neoprene soles were found to outlast the reclaimed rubber soles originally used at the beginning of World War II by 6 months or more.

"I was no inventor," Mr. Fellman says modestly now, "but I knew I had to produce a sole which would give traction on wet or icy decks." After many trial tests came the vacuum cup design.

Mr. Fellman also designed an overboard shoe for the Navy. This shoe has both zippers and laces to meet the stiff requirements that it be "comfortable, light enough for swimming, flexible, yet be rugged enough to support the ankle, stand up for tramping over coral reefs or through the jungle, and be adjustable for heavy and light socks."

Squeegee Action Stops Slips

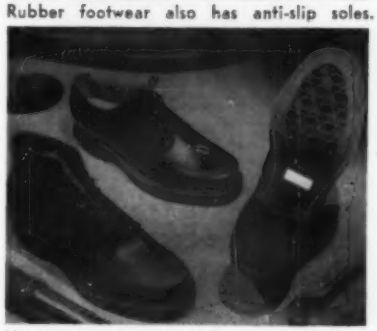
The non-slip sole's design of rings within rings creates traction by a squeegee action that grips the floor or deck and forces the water up into deep countersunk channels between the rings. Success of the design rests on the fact that it provides a drier treading surface for the foot.

This sole on various types of safety shoes is now available for industrial use, after its long development and successful use under the difficult conditions of "flat-top" wear.

Pictures by courtesy of DuPont De Nemours & Co.

Fleece-lined boots for cold jobs feature anti-slip sole for ice and winter hazards.

Rubber footwear also has anti-slip soles.



Neoprene vacuum-cup soles are featured on both these work and conventional styles.

Chicago Convention

(Continued from page 17)

"Only after considerable time have we begun to realize that maybe the shop foreman and his subordinate supervisors have a personal responsibility to see that the work performed by their employees is being performed in a safe manner."

Gadgets Not Enough

"The days when we could depend almost entirely on gadgets, procedures, practices, tools and motor vehicles are over. It will now take a lot of hard work by the line organizations. Line Supervisors will have to be constantly alert to their responsibilities toward safety—training and supervising their people day by day in the safe performance of their work so that the safe way becomes automatic. Supervisors must be trained in the powers of observation to such an extent that if work is being performed in an unsafe manner they will immediately recognize it. Recognition requires knowledge, and training is one of the most effective media we have in industry for providing job knowledge."

Approximately 7000 safety engineers, supervisors and key plant personnel attended the conference.

Materials Handling Show

THE NEXT MATERIALS HANDLING Exposition will be held in Chicago during the week of May 16, 1955, it was announced by Clapp & Poliak, Inc., New York, the firm which founded and produces the event. The displays will occupy the largest indoor exhibit space available in the nation. The show will be the first to use the entire combined area of Chicago's International Amphitheatre and the new exhibition hall under construction.

The theme of the show, as stated by Saul Poliak, producer, "The Concept of Obsolescence," has been adopted to emphasize that much handling equipment, put into use in recent years, is already outmoded by huge technological advances in handling methods. The exposition is an important factor in making industry aware of the huge costs involved in picking materials up, moving and setting them down again.

Despite the relatively recent introduction of modern mechanical handling equipment, progress in the field has been so rapid that many machines have been made obsolete by the adoption of systems which assign various functions to different kinds of equipment and which emphasize plant layout and the avoidance of any type of manual handling as their primary factors. More than 115 types of equipment will be on display.

Western Maintenance Show

AN EXTENSIVE VARIETY OF NEW industrial safety devices will be on display at the Western Plant Maintenance Show to be held in the Pan Pacific Auditorium in Los Angeles, July 13, 14, 15. A special feature of the first Western Plant Maintenance Show, arranged by Clapp & Poliak, Inc., will be displays of new economical and improved implements of safe scaffolding and flooring—two of the most important areas of plant maintenance activity.

Concurrent with the show, will be the Western Plant Maintenance Conference. The Conference, scheduled for July 13 and 14, will be held in the Ambassador Hotel in Los Angeles. Like the show the conference is aimed at directly aiding in solving the maintenance problems of production executives and management engineers in Western industry. To this end the Conference will offer a program of discussions and lectures directed toward separate levels of industrial maintenance—management, supervisory and technical—and programs directed toward maintenance in special industries, including aircraft, electrical, metal-working, food processing, and petroleum processing.

Management Club Holds Safety Night

The development of safe habits among individual workers is a management responsibility "and the most forward step in the creation of outstanding safety records for industry in general"——was the theme of a Safety Night program, held recently by the White Motor Management Club. Three hundred members of the club attended.

H. G. J. Hays, General Manager of the Ohio State Safety Council and Technical Consultant to the Greater Cleveland Safety Council, who was the feature speaker, said, "We have a moral responsibility to each other in our daily work in the plant. If we see anyone performing an unsafe act, it becomes our responsibility to correct him for his own protection and for the protection of his fellowmen."

Considerable promotion was given the Safety Night program by the club, an affiliate of the National Association of Foremen, and by the company's safety engineer. Exhibits of the safety equipment used in the plant were shown and safety leaflets were distributed along with souveniers. Door prizes were then awarded to the lucky ticket holders. The door prizes consisted of such safety items as safety shoes, first aid kits, fire extinguishers, etc.

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The personal interest of executives like Mr. Steudel, and the systematic bond purchases of more than 8,000,000 enrolled Payroll Savers are reflected in the following figures:

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- Purchases of E and H Bonds, by *individuals* during the first quarter of 1954, totaled $1,380 million—the highest for any quarter since 1945.
- The *cash value* of Series E and H Bonds held by *individuals* at the end of March, 1954, was $37 billion, 175 million—the highest in the thirteen year history of the Savings Bond program.
- Payroll Savers are serious savers: over 75% of the amount of Series E Bonds that matured since May, 1951 —almost $9 billion—is still being held by individuals under the Treasury's 10 year optional automatic extension plan.
- For the third straight month of 1954, sales of E and H Bonds exceeded maturities and redemptions. The sales excess amounted to $242 million on March 31—the highest first quarter net since 1950.

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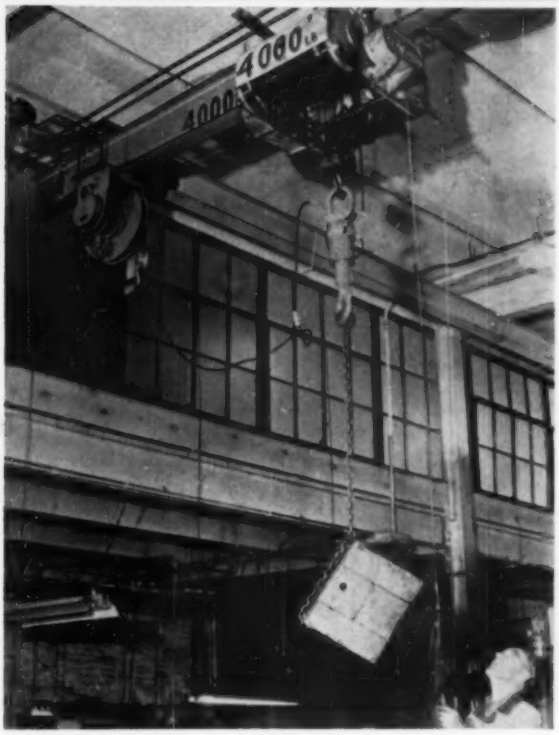
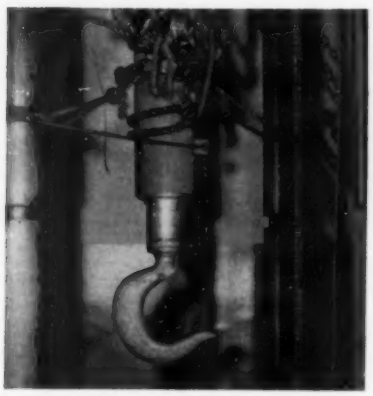
SAFETY MAINTENANCE & PRODUCTION

Crane scale on shop hoist eliminates a handling operation by determining weight of incoming and outgoing shipments.

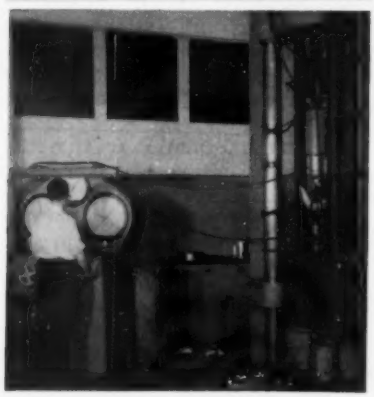


By ARTHUR C. RUGE
Ruge-deForest Inc.,
Engineering Consultants
Cambridge, Mass.

HANDLE and WEIGH loads in ONE STEP



Load-sensitive elements remain undamaged despite overload which opens crane hook.



Testing machine overloads scale 3 times, but calibration is off only .07 percent.

THE PRACTICABILITY OF WEIGHING loads during handling operations has been considerably increased by the recent development of an electrical weighing method and equipment. Load-sensitive units of extremely small size and weight, cable-connected to rugged direct-reading indicators, provide high flexibility and mobility.

In one of the first and simplest industrial applications of this method of weighing to the materials handling field, crane scales have been developed to hang on existing crane hooks. Special crane hook blocks have also been developed with built-in load-sensitive units. Indicators and/or recorders are mounted either in the crane cab, on a small cart to provide mobility at floor level, or in a fixed position. The load sensitive elements of these scales are resistance wire strain gages incorporated in load cells.*

Among the design problems has been the importance of retaining calibration and accuracy under high overloads. Safety against rupture of the unit under still higher overloads has been another essential to consider. Although safety for personnel using a crane scale is provided largely by visible deformation of the hook, provision has been made to withstand loads beyond the ultimate strength of the load-sensitive unit.

Hook Safety

Safety precautions for crane hooks provide that the hook must be of a material that deforms under high overloads and will not fail by rupture, thus providing a visible warning. It must straighten out until its point extends approximately horizontally from the vertical axis. Preferably this should occur when the load exceeds about 3 times rated capacity in the case of a crane scale.

The new crane scale pick-up has been designed to support well over 6 times its rated capacity, whether or not the sensitive element fails. This is accomplished by means of overload stops which take the load if the load-sensing element breaks,

(Continued on page 31)

* The name of the manufacturer of the crane scales can be obtained on inquiry to the Editor.

Bump that assures positive results

When fire strikes, seconds count . . . your fire extinguishers must be the right type and function properly from the very start . . . failure means serious losses.

The growing popularity of the highly effective powdered dry chemical fire extinguishing agent may be hampered by a drawback . . . settling or packing can occur after a lapse of time. However, with C-O-TWO Dry Chemical Type Fire Extinguishers there's no chance of this happening.

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The Fire Front

April Fire Losses Rise

ESTIMATED FIRE LOSSES IN THE United States during April amounted to $77,933,000, according to the National Board of Fire Underwriters. This loss represents an increase of 15.7 percent over losses of $67,362,000 reported for April, 1953, and a decrease of 8.1 percent from losses of $84,821,000 for March, 1954.

Losses for the first four months of 1954 now total $328,175,000 an increase of 9.3 percent over the first four months of 1953, when they amounted to $300,198,000.

Insure Against Fire

"THE LOSS WAS FULLY COVERED BY insurance" is one of the most misleading phrases in modern business usage. This is particularly true about fires, according to Chester I. Babcock of the National Fire Protection Association, because "serious fires usually involve many uninsured and uninsurable losses." He stated at a recent meeting of the N. Y. National Insurance Buyers' Association that any insurance buyer who thinks his property is fully covered by an insurance policy against loss by fire is deceiving himself.

"Adequate protection," Mr. Babcock said, "must include in addition to insurance policies a sound fire protection program to prevent serious fires from occurring." Citing cases from the 293 largest fires of 1953—a loss of over a quarter-million dollars each—he pointed out that most disastrous fires stem from violation of the fundamental principles of sound fire protection. And he urged the insurance buyers never to forget that: "1—every fire destroys *forever* something of value; "2—the insurance premium you pay is determined to a large extent by the aggregate value of material destroyed by fire; and . . ." 3—there are many indirect losses not ordinarily covered by an insurance policy and others which cannot be covered.

GM Fire—Aftermath

THE GENERAL MOTORS FIRE AT Livonia, Mich., last summer put 23,000 men out of work for indefinite periods, caused a drop in city and community tax revenues of nearly $250,000, and a drop in retail sales of about 65 percent while the plant was out of operation.

Fire Protection Engineers Elect

JOHN A. NEALE WAS RE-ELECTED President of the Society of Fire Protection Engineers at the Society's annual meeting. Mr. Neale is Chief Engineer of the National Board of Fire Underwriters, New York, N. Y. Other officers elected at this meeting were First Vice-President, Elmer F. Reske, Manager, Cook County Inspection Bureau, Chicago, Ill.; Second Vice-President, William G. Schultz, Chief Engineer and Assistant Vice-President, Lumbermens Mutual Insurance Co., Mansfield, Ohio; and Secretary-Treasurer, Robert S. Moulton, Technical Secretary, National Fire Protection Association, Boston, Mass.

What Is "Noncombustible"?

THE NATIONAL BOARD OF FIRE Underwriters has presented a definition of noncombustible building construction material. It applies to material used for the walls, roofs, or other structural parts of buildings, but it does not apply to surface finish materials, and is not applicable to the determination of whether a material is noncombustible from the standpoint of clearances to heating appliances, flues or other sources of high temperature. Some materials defined as noncombustible may not be suitable to be placed close to heat producing appliances because of charring, discoloration, cracking, or disintegration which the high temperature may produce. It has been drafted for use in connection with codes and standards which make reference to noncombustible (or incombustible) materials in the construction of buildings or other structures.

Noncombustible as applied to a building construction material means a material which, in the form in which it is used, falls in one of the following groups (a) through (c). No material shall be classed as noncombustible which is subject to increase in combustibility or flame spread rating beyond the limits established, through the effects of age, moisture or other atmospheric condition as, for example, various types of treated wood. Flame spread rating refers to ratings obtained according to the Standard Test Method for Fire Hazard Classification of Building Materials of Un-

derwriters' Laboratories, Inc., ASTM E84.

(a) Materials no part of which will ignite and burn when subjected to fire. Examples: asbestos fiber, brick, clay tile, concrete, glass, gypsum, iron, portland cement, slate, steel, stone.

(b) Materials having a structural base of noncombustible material, as defined in (a), with a surfacing not over ⅛-inch thick which has a flame spread rating not higher than 50. Examples: certain types of protected steel sheets, gypsum wall board.

(c) Materials, other than as described in (a) or (b), having a surface flame spread rating not higher than 25 without evidence of continued progressive combustion and of such composition that cross-sections in any plane would not have a flame spread rating higher than 25 without evidence of continued progressive combustion. Examples: certain insulation materials as, blocks of cellular glass, boards of glass fiber, slabs made of excelsior impregnated with portland cement; certain sandwich type materials; certain plastic sheet materials.

Large-Loss Fires

LARGE-LOSS FIRES—THOSE THAT destroy property worth $250,000 or more—are a cause of growing concern to fire protection engineers. Some 300 such fires annually, while representing only a small fraction of one percent of the total number in the United States, account for about 24 percent of the nation's dollar fire loss, which last year amounted to $903 million. These fires have a serious effect on the economy, especially at the local level, and on the nation's defense potential.

Fire Control at UN Headquarters

The elaborate fire control system for the United Nations Headquarters in New York is master-minded from this one-panel control board and fitted into this specially-designed steel desk. Automatic floor and room checks and danger signals are flashed onto the facing wall panel from all sections. Alarm and control devices are then set in push-button motion from the control desk.

Besides containing structural charts, floor plans and complete personnel data, the desk acts as the nerve center for the communicating wires which are concealed beneath the surface and which culminate in the master control box on top.

Picture by courtesy of the Art Metal Construction Co.

Get Together for Safety

CITING THE UPWARD TREND OF industrial fire losses in the United States, Mr. A. L. Kling, American Cyanamid Company's assistant safety director called for a re-examination of the relationship between industry and insurance underwriters, at the National Fire Protection Association in Washington. More emphasis, he said, should be placed on the insurance company's role in fire safety education and fire equipment inspection. In nearly all recent cases of industrial fire loss, adequate facilities for control were available, but they were either not used or were inoperative when needed.

Mr. Kling called for more widespread hiring and training by insurance firms of highly specialized engineers to develop and interpret adequate safety standards and new control measures. To be properly receptive to fire prevention services of underwriters, he added "industry must consider its relationship with the underwriter as something broader than rates and the sharing of risk. It must be ready and willing to assume its portion of the responsibility for a joint, practical fire protection program. When this understanding and outlook has been developed by the assured, then, and only then, should it expect specialized engineering service from the underwriter.

NFPA Meets

FIRE—HOW TO PREVENT IT, FIGHT it, control it—was the single theme of the Annual Meeting of the National Fire Protection Association, 15,000 member technical-educational fire safety organization, held in Washington, D. C., early this summer.

Twelve major sessions during the week-long program covered fire safety developments in aviation, industry, education, in building, warehousing and storage, and in both the city and rural fire service.

Control of Lithium-Aluminum-Hydride Fires

THE fire hazard of lithium aluminum hydride has always been a headache for safety engineers in pharmaceutical plants and other installations where this chemical is used in processes.

Recent tests, conducted at a large midwestern pharmaceutical plant, indicate, however, that fires of this volatile chemical can be controlled effectively with dry chemical fire equipment, reports the Ansul Chemical Co.

It is known that the use of water to extinguish fires in the lithium aluminum hydride ether solution is not recommended due to the reaction which will take place. The increased evolution of hydrogen and rapid generation of heat when water reacts with the hydride will tend to increase the intensity of the fire and more than counteract any cooling effect that the water has.

The specific hazard which the company desired protected during the tests was a reaction process vessel. A one-percent solution of hydride in ether was used.

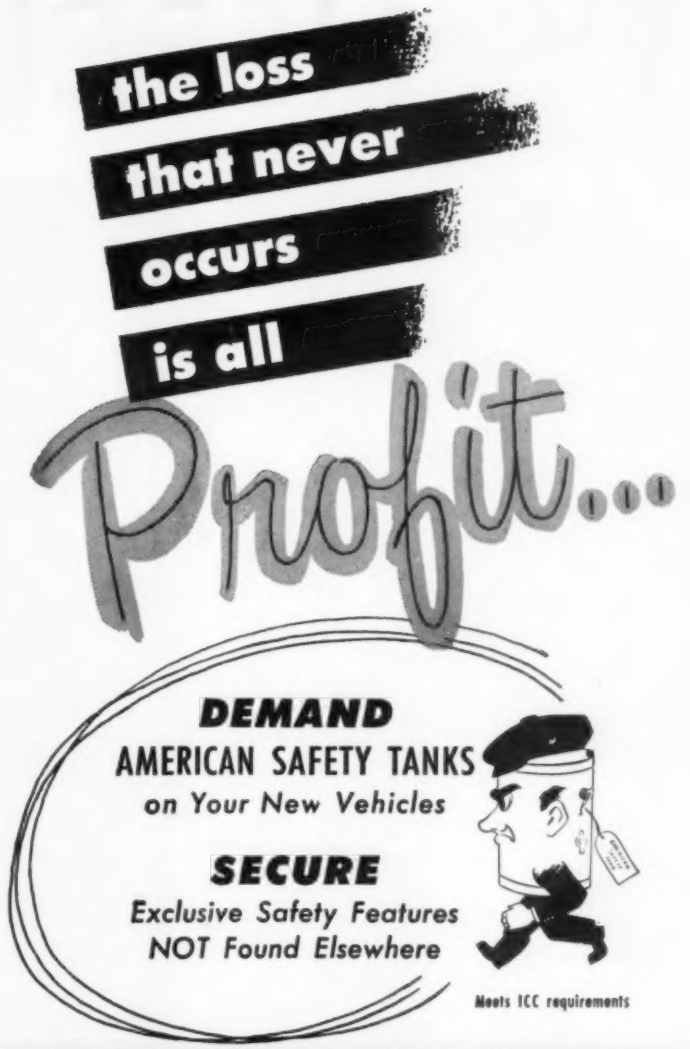
The engineers ignited five gallons of the solution in a 3 by 4 foot pan and gave it a sixty-second pre-burn. Using a 30-pound hand dry chemical unit, the putout was achieved in four seconds. There was an auto-ignition reflash which was extinguished quickly. Final extinguishment was assured by intermittent application of dry chemical to keep surface vapors dispersed until the danger of reflash was over.

Later, another hydride fire was extinguished in nine seconds with a long-range nozzle. This time there was no reflash because the pre-burn was only of ten seconds duration.

Still another fire, a spill of five gallons of hydride which ignited by itself on the ground, was extinguished with dry chemical in sixteen seconds after a fifteen-second pre-burn period.

Final recommendation of the engineers was for protection by portable and wheeled dry chemical extinguishers, supplemented by small water lines for equipment cooling.

The engineers emphasized that these fires must not be extinguished unless the flow of liquid or vapors can be shut-off, thus removing the possibility of an explosion of the accumulated gases. In any event, it is imperative that complete ventilation be established immediately to rid the space of all flammable gases.



(For full details, use Key # T-9 on free Inquiry Card on page 71)

Scholarship Program

ANNOUNCEMENT OF A scholarship program for architectural students was made by Charles P. Jervey, at the 88th annual meeting of the National Board of Fire Underwriters.

The program will be administered by the American Architectural Foundation, Inc., which through local committees will make cash awards to promising students in accredited architectural colleges.

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ALFRED M. BEST COMPANY, INC.
75 FULTON STREET, NEW YORK 38, N. Y.

(For full details, use Key # T-26 on free Inquiry Card on page 71)

LAST YEAR'S FIRE LOSSES

WHY
were they the highest on record

WHAT'S
being done about them?

WHILE THERE WERE 7 PERCENT fewer fires in the United States during 1953 than in 1952, fire losses during 1953 increased 6.1 percent over the previous year. This is the third straight year that fire losses have increased.

These were among many facts on the country's fire situation brought out at the National Board of Fire Underwriter's recent meeting.

The increase in losses over last year was largely the result of the disastrous fire in August at a large General Motors plant, it was pointed out. William L. Nolen, chairman of the Board's committee on statistics and origins of fires, explained that the 7 percent decrease is reflected in a 1 and a half percent decrease in "building fires" (the first decrease since 1949) and a 10 and a half percent reduction in fires other than those in buildings, (the first since 1951).

Mr. Nolen significantly stated that the areas in which the number of fires increased were "non-residential assembly" and "manufacturing," each by 4 percent or more. Decreases were noted in mercantile—4 percent, storage—3 percent, and residential—2 percent.

Significant Trends

The meeting noted that the decrease in number but the increase in size of fires during the year spotlighted the dangerous trend towards larger industrial fires. Last year large loss fires (those that destroy property worth 250 thousand dollars or more) represented less than 1 percent of the total fires, yet they accounted for nearly 24 percent of the total national fire losses. It was emphasized that fires of such magnitude seriously affect the national potential for continued expansion of the country's economy.

It was also noted that the factors producing these fires are surprisingly uniform from year to year. They were listed as excessive areas, location of plants in communities too small to provide appropriate fire protection, and a lack of automatic fire protection.

Another dangerous trend seen is the growing number of insufficiently manned fire departments. This apparently is based on economic reasons, but the meeting was told that there is "no substitute" for manpower in fire departments. The need for fast action in laying hoses, advancing hose streams to the center of the fire, performing rescue work, and in manning apparatus requires adequate manpower. Little net gain was reported in the effectiveness in fighting fire in recent years despite im-

provement in methods and equipment. The loss of manpower and the appearance and use of new combustible materials and processes have cancelled the advances out.

Inferior Materials

Still another danger seen increasing is inferior building construction and its contribution to worse fires. Last year, approximately a million fires caused a billion dollars in losses. However, one-fourth of the total fire waste was caused by 300 fires. Excessively large areas constructed and construction outside areas controlled by building codes are responsible for many large fires it was pointed out. Urgency of speed and cheapness in construction have also encouraged the use of building materials whose fire hazards have not been evaluated. Special provisions must be made for new building designs such as windowless buildings, for they delay the detection and extinguishment of fires that break out.

Fire Causes

The dual cause of "matches—smoking" still continued to be the largest single cause of claims for property loss. Misuse of electricity continued in second place. Over a 10 year period, 1943 to 1952 it amounted to 12.20 percent of losses, while "matches—smoking" accounted for 26.17 percent.

One cause of fire should be down —arson. Arrests for arson were down 9 percent over last year; convictions were down 15 percent. However the year 1953 was the worst on record for tornadoes which caused well over 24 million dollars damage.

What To Do About It?

The NBFU meeting also heard reports on what was being done to educate and protect against the danger of fire. The Board maintains up-to-date reports on the fire fighting facilities of 503 cities in the nation with over 25 thousand population. The Board's building and fire prevention codes have been adopted by 849 and 699 cities respectively. Another 1100 have adopted the National Electric Code. It was urged that adoption and enforcement of these codes by other communities would be excellent steps toward greater fire safety.

Educational Material

Reports on building materials, fire tests, characteristics of flammables of varying kinds, and on such problems as warehouse fires have been made available by the Board's research division and laboratories. Film libraries, increased advertising on television, radio, and in periodicals, and increased distribution of NBFU publications were also listed as helping in the fight against fire, and in the education of the public.

Picture by courtesy of Ansul Chemical Co.

FIRES RESULTING FROM KNOWN CAUSES

January 1, 1943 to December 31, 1952 inclusive

Causes	Claims Number	Claims Percent	Property Loss In Dollars	Property Loss Percent
Matches—Smoking	616,014	26.17	$419,105,264	17.35
Misuse of Electricity	289,336	12.29	292,915,222	12.13
Exposure (Fire originating off premises)	182,736	7.76	263,678,787	10.92
Petroleum and its Products	201,287	8.55	215,443,699	8.92
Stoves, Furnaces, Boilers and their Pipes	160,443	6.82	213,728,390	8.85
Overheated or defective Chimneys, Flues, etc.	118,764	5.05	144,396,315	5.98
Spontaneous Combustion	47,464	2.02	134,803,034	5.58
Lightning	202,658	8.61	129,518,108	5.36
Miscellaneous—Cause Known, not classified	84,603	3.59	122,292,945	5.06
Friction, Sparks from Running Machinery	26,055	1.11	76,590,800	3.17
Open Lights	76,283	3.24	73,981,180	3.06
Gas—Natural and Artificial	41,876	1.78	59,869,785	2.48
Ignition of Hot Grease, etc.	98,710	4.19	52,467,654	2.17
Explosions	25,017	1.06	50,061,258	2.07
Hot Ashes and Coals—Open Fires	68,023	2.89	48,279,791	2.00
Sparks Arising from Combustion	26,000	1.10	40,190,625	1.66
Sparks on Roofs	41,242	1.75	39,106,596	1.62
Rubbish and Litter	44,709	1.90	37,131,885	1.54
Fireworks, Balloons, etc.	2,814	0.12	2,112,345	0.08
	2,354,034	100.00	$2,415,673,683	100.00

10 Lbs. of Dry Chemical Ends 2-Day Oil Well Fire

AN OIL WELL FIRE IN OKLAHOMA that burned for 40 hours, causing $40,000 worth of damages, was extinguished in exactly five seconds with a single 30-pound dry chemical fire extinguisher recently reports the Ansul Chemical Co. Biff Hansen, fire chief at the Continental Oil Refinery in Ponca City, Okla., estimated that ten pounds of the dry powder was used to put out the fire, which previously had resisted all efforts at extinguishment by other types of equipment.

40 Hour Blaze

The fire started when gas blew out of the oil well hole at 1,350 feet and was ignited by the exhaust from a diesel engine. Flames leaped hundreds of feet into the air, burning up gas at a rate of a million cubic feet every 24 hours.

City and industrial firefighting units rushed into action but the blaze roared on. Nearly 40 hours after the blaze started, Chief Hansen at Continental Oil, located 24 miles away, was asked to send both equipment and personnel.

Fire Training

Operators of the extinguishing equipment received their training at Ansul Chemical Company's Customer Fire School at Kansas City. The company is conducting eleven other fire training schools this summer on its seven-acre fire test field at Marinette, Wis.

One Step Weighing

(Continued from page 23)

a possibility when the load exceeds 5 times rated capacity.

To determine actual performance of a stock crane scale, engineering consultants arranged tests for a standard 12 and a half-ton crane scale. Loads up to 100 tons were applied, using eyes after hook failure, in a series of 9 tests.

In the first 2 tests capacity load only was applied through a calibration cell which provided much higher accuracy than a testing machine indicator. Simultaneous readings were taken on the crane scale indicator and the manually balanced calibration indicator. The second calibration test was run to check repeatability. The calibration cell was then removed and thereafter was used only for calibration checks after application of various overloads to the crane scale pick-up.

No Shift in Zero

A load of 50 thousand pounds, twice rated capacity, was applied by the testing machine. A calibration check run up to 24 thousand pounds after this overload showed agreement with the initial calibration within 0.07 percent and no shift in zero reading. A load of 75 thousand pounds, followed by a calibration run showed a zero shift of 25 pounds, but after adjusting zero the calibration was still within 0.07 percent of the initial calibration. At a load of 98 thousand pounds enlargement of the hook opening necessitated replacement with an eye like that on the upper end of the crane scale. The swivel action of the hook was unimpaired.

Stops Hold

The load was then increased until the load-sensing element ruptured. This occurred at a load of 167 thousand pounds, 6 and a half times its rated capacity. Upon rupture of this element, load transferred itself to overload stops which gave no indication of distress with further increase up to 200 thousand pounds.

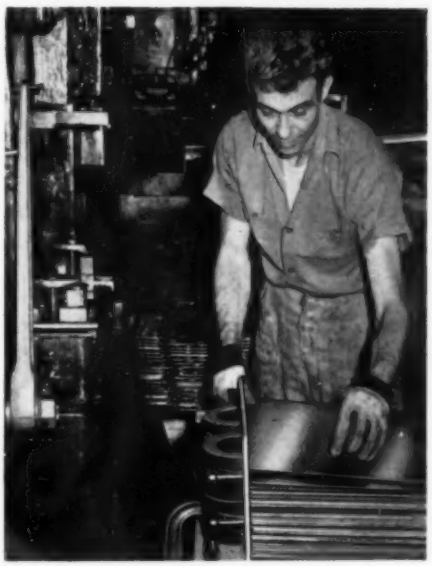
The tests clearly showed that the crane scale will withstand 3 times rated capacity load without suffering loss in weighing accuracy of precision grade and without recalibration. Furthermore, ample visual warning of overload was given by end fittings well below the failure point of the load-sensing element. Although the eyes were severely deformed at loads above 3 times rated capacity they proved to be capable of sustaining a load far in excess of the ultimate useful hook load.

Here then is a successful answer to the problem of weighing materials while handling them, without losing the all important factor of safety.

Pictures by courtesy of Baldwin-Lima-Hamilton Corp.

"SAFETY MAINTENANCE" Salutes a Safety Idea

Separators Cut Costs and Injuries



ABOVE—As operator inserts steel sheet in press, separator raises next sheet from pile for easy and safe lifting.

LEFT—Operator lifts steel sheet from separator before he places it in punch press to be formed into switchbox or cover.

ONE PHASE OF OPERATIONS AT Cutler-Hammer, Inc., electrical manufacturers, involves making switchboxes and covers from 16 and 18 gauge steel sheets of varying sizes. For some time manual separation of the sheets with a sharp metal instrument has worn out gloves at a rapid rate and produced many trips to the dispensary for painfully cut hands.

Now, however, the company has almost eliminated injuries from this source and cut labor costs 5 percent by installing magnetic separators in this department of the plant. Glove wear and replacement costs for gloves have been greatly reduced.

The separators employ a magnetic principle, inducing a magnetic field among the stacked sheets causing them to repeal each other. As the operator inserts the first steel sheet into a press the next sheet is raised and ready to be lifted easily. No longer does the operator have to stop and struggle with the next sheet, while worrying about the danger to his hands. With the new separators, which come in different sizes to suit the sheet metal, he is free of injury and can increase his production in a relaxed state of mind.

Pictures by courtesy of Bass and Co.

Mechanical Refrigeration Code

THE American Standard Safety Code for Mechanical Refrigeration, just revised, according to its stated purpose, is to provide "safeguards to life, limb, health and property," and to make standards that will mean progress for all refrigerating systems.

The standard applies to refrigeration equipment used for air conditioning purposes, as well as to residences of more than two families and all institutions, places of public assembly, commercial and industrial buildings and mixed occupancies, or buildings used for different purposes in various parts.

The revised code makes provisions for improvements in refrigeration since 1950, when the previous edition of the code was approved. It clarifies the requirements for mechanical refrigeration in all buildings, but does not apply to refrigerating systems in motor vehicles, trailers, on shipboard or trains.

The sections on piping and pressure vessels have been completely revised for maximum safety because of newly acquired knowledge in the field. Specifications for pressure relief devices have been expanded. New refrigerants, such as Carrene No. 7, have been recognized as giving safe, reliable service.

The code embodies four major factors for improving refrigeration:

1. Puts refrigerants in three major classes, namely, safe, toxic and flammable.

2. Limits quantities of dangerous refrigerants.

3. Provides relief devices so vessel or pipe will not rupture under pressure.

4. If and when this standard is uniformly adopted by government agencies having jurisdictional powers, a refrigerator manufacturer can put his product on the national market, without having to make special modifications to conform to state or municipal regulations.

The American Standard Safety Code for Mechanical Refrigeration was developed by representatives of national groups concerned with the manufacture of mechanical refrigeration equipment and refrigerants, government, safety and insurance groups, and representatives of users.

The American Standard Safety Code for Mechanical Refrigeration, B9.1-1953, may be obtained from the American Standards Association, 70 East 45 Street, New York 17, N. Y., at $1.00 a copy.

American Standard Issued For Durable Flooring

STANDARD requirements for a floor that will stand up under severe service in industrial plants or public buildings have just been announced by the American Standards Association. Details have been released by the Association under the title, "American Standard Specifications for Industrial Granolithic Oxychloride Flooring and Its Installation." The standard is one of a group on oxychloride flooring issued this year.

The specifications provide for a floor of the terrazzo type which is extremely hard, tough and durable. The aggregate is crushed granite, trap rock or similar hard stone chips, and is not ground to such an extent as to produce a high polish. This type of flooring is used mostly where decorative effects are not required. The standard gives detailed requirements for materials used in mixing the aggregate, conditioning the area to be covered, preparation of subfloors, method of application, thickness, sealing, and the protection of the finished installation. Also included in the specifications are methods of testing the consistency of the flooring, material, linear change, flexural and compressive strength, and method of gauging the flooring solution.

Copies of this American Standard may be obtained from the American Standards Association, 70 East 45 Street, New York 17, New York, at 35¢ per copy.

Standards Library

CAN you tell us where to find information on safe construction of tubular pole scaffolds?

This and thousands of other questions concerning accident prevention and the safety of human lives can be answered by the library of the American Standards Association. A new booklet published by the Association, "*The Library of Standards*," tells what the library is, what it contains, what it can do.

The booklet is a pocket-size guide to 60,000 standards, specifications and related documents and a file of technical material.

The ASA exchanges standards with 40 nations. The library contains over 1300 American Standards, 8000 German, 4000 French, 2000 British and 3500 of the most important of Russia's 8000 standards.

The library also maintains a complete file of specifications issued by the U. S. Government including standards of the Federal Supply Service (the Federal Specification Board), Department of Defense, Simplified Practice Recommendations, and some documents of state

regulatory bodies concerned with safety.

The ASA sustains the library for the use of its members and also as a public service. Free copies of the booklet on ASA's library may be obtained by writing or calling the American Standards Association, 70 East 45 Street, New York 17, N. Y.

Testing of Equipment for Window Cleaners

THE Board of Standards and Appeals of the New York State Department of Labor has designated the American Standards Testing Bureau, Inc. as an approved laboratory for conducting tests of window cleaners safety devices as prescribed by Industrial Code Rule 21. The Board also said that "all such tests shall be in full accord with the test procedure prescribed by the Board in its rules."

Construction Safety Code

CONSTRUCTION and demolition workers will enjoy greater on-the-job safety as the result of improvements in the N. Y. State Labor Department's Industrial Code which became effective April 15.

"Use of new building materials and techniques in both constructing and demolishing buildings, and the introduction of machines such as the power buggy for handling materials, led to revisions in this code," Industrial Commissioner Edward Corsi declared.

The most significant amendments in the code rule make the following changes:

(1) Prohibit any employee from working on top of a wall during demolition of a building.

(2) Remove the requirement for use of catch platforms during construction of chimneys.

(3) Raise the minimum height at which catch platforms must be maintained from 35 feet to 75 feet during demolition of an exterior masonry wall.

(4) Protect the workers from the dangers of fumes from vehicle engines, or other motors, while on the job.

(5) Regulate use of power buggies. This completely new section of the code requires that only competent, trained operators be allowed to run these buggies. Design and construction must conform to code specifications. Maximum speed of operation is set at 12 miles per hour. Specifications are set up for the runways and ramps upon which the buggies are operated.

Copies of Industrial Code Rule #23 containing the new amendments—price $.25 per copy—may be obtained by writing the New York State Department of Labor, Room 601, 80 Centre Street, New York.

Get a Safe, Sure Grip... with HOOD ANTI-SLIP GLOVES

Model R-45

Also available as R-46, fully coated with natural rubber.

Hood Rubber Company makes a complete line of rubber and plastic gloves for industrial uses. Write today for illustrated catalog featuring Hood Glove Guide — "How to choose the RIGHT glove for EACH job".

HOOD RUBBER CO., WATERTOWN, MASSACHUSETTS

A division of the B. F. Goodrich Company

(For full details, use Key # T-10 on free Inquiry Card on page 71)

Safety on Film

Welding Safety Film

A NEW sound slide-film on safety in the use of oxyacetylene cutting and welding equipment has been produced by the Air Reduction company.

The film "The Guy Behind Your Back", is a fundamental approach to the factors affecting safety when operating oxyacetylene welding and cutting torches and cutting machines. It is specifically designed for companies to train their own employees. The story is presented with cartoons and is accompanied by an informal narrative. Free showings of this 20 minute film may be arranged by getting in touch with any office of the company. Also, copies of the film may be purchased from any Airco office at the nominal cost of $15 each.

Additional information may be obtained by writing Air Reduction Sales Company, 60 East 42nd Street, New York 17, New York.

Construction Safety Film

RUSSIAN roulette is a sucker's bet. The odds are good—5 to 1 that you won't lose—but no gambler would take these good odds because there is nothing to gain and everything to lose.

A new Caterpillar Tractor Co. film entitled "The Gamblers" points up how careless operators of heavy construction machinery often play a game with just as good or better odds than the infamous Russian pistol game of chance, but with the same dire results if they lose.

This non-commercial film takes a new approach to the promotion of safe operation of construction machinery. It is unique in that it spurns the usual "how to do it safely" approach to proper operation of machinery. It documents many typical every day scenes on any construction job where an operator may get careless.

The film had its premier showing before the construction section of the National Safety Congress held last fall in Chicago. It was received by these representatives of the construction industry with enthusiasm. The 20-minute film, which was produced by the Calvin Company of Kansas City, Missouri, can be seen by contacting any Caterpillar Dealer, domestic and export.

V-Belt Slidefilms

THE second group in a series of educational 35mm sound slidefilms for industry is now available through Allis-Chalmers General Machinery Division district offices. The three slidefilms are on the subject of v-belt drives and each runs about 20 minutes. They are titled "In Every V-Belt Drive," "For Better Driving," and "Selecting a Drive."

The first, in color, covers the engineering principles that are basic in every v-belt drive application. The second concerns itself with the installation and maintenance of multiple v-belt drives. The third tells how to check characteristics to find the best type of drive and then engineer it to do the job.

Prepared for such audiences as industrial maintenance men, plant engineers, design engineers, and engineering students, the films make good use of drawings, humor and step-by-step photographs to get their points across. Requests for showings of any of these slidefilms should be made to the nearest Allis-Chalmers General Machinery Division district office.

Penn. R.R. Produces New Safety Film

A PREMIERE screening of "Escape from Limbo," a drama-packed new training film with a powerful safety lesson for Pennsylvania Railroad employees, was held in New York recently for the press and industry representatives.

The 26-minute color film was produced by Unifilms, Inc., for the railroad's Safety Department for showing to the "men who run the railroad," employees in train service and yard operating forces, and to others stationed in the 13-State area in which the Pennsylvania System operates. More than 100 trainmen, brakemen, switchtenders and other yard workers to whom the film's frank message is directed, appeared in scenes filmed on the railroad.

In allegorical style "Escape from Limbo" tells about a railroad man who, unconscious from a hunting accident, dreamed he was forced after death to go back from limbo to earth to whisper encouragement to safety violators and help them to be disabled or killed. When the railroader discovers his whispering is futile, he returns to limbo to confront his "boss" with the conclusion that "every man is his own keeper" and no outside suggestion can control him.

"The film carries the grim warning that, rule books and safety training and meetings notwithstanding, carelessness and lapse of memory can lead to trouble when an accident is least expected," John T. Williams, the Pennsylvania's Manager of Safety, said. "All the safety devices in the world won't save a brakeman if he steps in front of a moving train."

Vision Testing

"WORKMEN who are not aware they have defective vision may be unintentionally doing poor work and turning out inferior products," was the opinion voiced recently by Dr. Rex H. Wilson, medical director for The B. F. Goodrich Company, Akron, Ohio. Speaking before the Occupational Vision Conference at the University of Maryland in Baltimore, Md., Dr. Wilson pointed out that of all the human skills required of a workman, that resulting from vision is certainly one of the most important.

Inspection Suffers

"Not only do poor products result from faulty vision on the part of workmen," he said, "but ironically enough, final inspectors, usually older and more experienced employees, may also have deficient vision, and, as a result, may approve substandard workmanship and products."

"Industrial managements have a wonderful opportunity of doing a job of preventive medicine, of improving employee relations and morale through use of visual surveys conducted on a voluntary, confidential basis."

Glasses and Age

Dr. Wilson described a visual survey conducted by his own company which revealed that a general increase in the need for wearing corrective eye glasses, with increasing age, occurred among all groups tested. In ages above 50, more than 90 per cent required corrective glasses and more than 53 per cent of those taking the examination needed assistance.

"On the basis of such surveys," Dr. Wilson concluded, "industrial managements should start on the basis of the value to employees, but the results are rewarding in better quality products and more efficient production."

NEW
protective cap combination
by DAVIS

...featuring the "Speedy Attachment" for connecting cap and shields

Without special tools, or fittings on the cap, the Davis "Speedy Attachment" permits quick and easy attachment and detachment of welding helmets or face shields on protective caps of all shapes and sizes.

Two patented clips, held in tension under the rim of the cap by a tough, adjustable neoprene band which crosses the top of the cap, hold the helmet or shield securely in place.

Code No. 14-168-2C

Complete Face Shield-Protective Cap Combination

Heavy fibre spark deflector pivots on aluminum band and holds clear plastic shield securely against the band to prevent entry of sparks or dirt.

Various thicknesses and sizes of plastic windows as well as wire mesh fronts are available. Windows may be easily removed and replaced.

Code No. 14-406C

Under-Chin Welding Helmet-Cap Combination

Welder's helmet moulded from fiberglass-reinforced plastic. Heat resistant, lightweight, non-warping and moisture proof, the helmets are exceptionally strong and easily sterilized. Stationary or "lift front" windows.

Write for Bulletin No. 1409

SAFETY DAVIS DIVISION

DAVIS EMERGENCY EQUIPMENT CO., INC.

55 Halleck Street, Newark, New Jersey

(For full details, use Key # T-11 on free Inquiry Card on page 71)

Our Secret Weapon

(Continued from page 10)

What are the factors that will promote better safety in small plants as well as large ones? It has been proven over many years of operation in our company that the most important is a top management which not only sincerely believes in safety, but insists upon it. This insistence must be a cornerstone of day-by-day operating policy. If safety is demanded at the top, and if it is considered importantly in a man's performance record, there is nothing in the world than can stop it from being emphasized all the way down through the ranks to the newest employee.

Other steps inevitably follow. Plant safety committees which include representatives of manage-

ment as well as workers help to focus attention upon the problem, and it is further proof to employees that the company means what it says when it asks them to work safely.

The goal should always be preventive safety, rather than correction after an accident. Plants and machinery should be designed for safe operation. Before new plants or equipment are operated, they should be carefully inspected by a committee of the same people who will be responsible for the operation, and this committee should consider safety as well as other factors. Protective clothing and equipment should be required wherever there is a potential hazard.

Safety training for the new employee is essential. There is little danger of carrying it too far. The time lost in instruction will pay extra dividends. Not only will it keep the employee from falling into work habits that are inefficient as well as unsafe; it will also show the newcomer that he is regarded as an individual, and will early secure his loyalty. *No one can have confidence in nor be loyal to an organization which ignores his welfare.*

I hope our smaller businesses will take up the challenge of the industrial accident statistics. The rewards for them will be more than worth the effort.

Off-the-Job Safety

The second field in which industry—large and small—can do more than it is doing is public, or off-the-job safety. Not only is there just as much human suffering, but there is just as great an economic loss from an injury on the highway or in the home as there is from one in the plant. When a skilled workman is unable to report for duty, it is little comfort for industry to reflect that the factory is safer than home or highway.

When it comes to off-the-job safety, let me cite what we have discovered in our company. In all of our plants and laboratories last year, we had 11 times as many injuries to our people at home or at play as we had at work. Yet—and this is important—our employees were 3 times safer off the job than the average employee. Safe habits at work instinctively lead to safe habits elsewhere.

Recently the son of one of our employees went to work for the company. During his first month, he had one complaint which he confided to his father. His supervisors and his fellow workers preached safety to him until he was tired of hearing it. He wanted no more of it. Then it happened. He came home one evening and saw a raised doorsill. "You know, dad," he said, "that isn't safe. I'm going to fix it."

The incident in that household undoubtedly is being repeated in homes of industrial workers throughout the country. Safety certainly is contagious, and the habit cannot be quarantined.

Nevertheless, the problem of home safety is increasing. The magazine, *Nation's Business*, recently quoted an insurance company as saying the new "do-it-yourself" hobby accounted for 638,000 accidents last year, or 16 percent of the home total.

Number One Killer

Similarly, we don't need the grim reminder of the headlines in Monday morning's newspapers to realize that highway accidents remain our Number One Killer.

We have inaugurated an interesting program at the company's Experimental Station. On a volunteer basis, the scientists and technicians who work there are attending lectures on better driving habits. They are taking a series of tests to learn just what to expect under certain driving conditions, involving distance judgment, night and glare vision, and reaction time.

Since December, there hasn't been a traffic accident involving an employee of the Station, and there are approximately 2,700 people there. A number have had their glasses changed, and some have reduced their night driving to a minimum. The flow of traffic in and out of the Station at peak hours is much smoother.

There is no compulsion upon employees to take part in the program, nor any attempt to control their activities away from work. The sole purpose is educational—to implant a will for safety, and convince the employee that safety away from the plant is important to the company as well as to the employee and his family. Above all, the program stresses driving courtesy. The American people may be careless but they are not selfish. They learn quickly that courtesy and thoughtfulness on the highway beget courtesy and thoughtfulness from others. If you don't believe it, ask any cab driver —or better still, conduct your own experiment. If you slow down to let another driver come out of a side street or get into your lane, the odds are heavy that before you have gone a mile, you will see that driver extend a courtesy to someone else.

Put It To Work

For 40 years American industry has been the leader in the safety movement in this country. We have accumulated a vast store of know-how. We understand the desirability and necessity for good safety performance, and yet within our own ranks we have a wide margin between the best and the worst. We are not putting all our knowledge to work, and this we must do.

Further, we must measure up to our responsibility and take the initiative in seeing that the principles which we have found successful are extended widely among our people.

Finally, our position of world leadership carries with it a grave responsibility. We must see to it that our country does not falter in these critical times. We must be strong and we must use our strength wisely to preserve our way of life. Not to be safe is wasteful. To be safe is efficient. Without safety we cannot be productive, and only by being productive can we be strong, and preserve the freedom of America.

From an address delivered at the 24th Greater New York Safety Convention.

"What's the Law?"

Edited by
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• • •

Back and Leg Injuries

WHILE WORKING AT A GRINDER, this man was struck in the back by a 20 pound sledge hammer wielded by a fellow employee. He was taken to the hospital in an ambulance and remained there 2 and one-half days. Thereafter the company doctor at the plant refused to treat him; he sought another doctor, and tried a number of different kinds of jobs.

But at all times, he suffered severe pain in his back and left leg. At the formal hearing before the Industrial Commission, 3 medical specialists testified as to the nerve involvement in the claimant's leg with the result that the Commission awarded the injured 20 percent permanent loss of use of the left leg.

ELECTRO-MOTIVE DIVISION, G. M. C. vs. THE INDUSTRIAL COMMISSION. Illinois Supreme Court, No. 32,133, January 24, 1952.

Defective Match—Not Compensable

The Workmen's Compensation Acts do not contemplate those risks of injury to which the general public is also exposed. This interpretation comes down from the Illinois Supreme Court after hearing an appeal on the following case.

The driver of a truck carrying soft water tanks entered his truck after delivering a tank. Before going on to the next stop, he proceeded to light a cigarette. The head of the match flew off, hitting him directly in the left eye and eventually causing him to lose sight in it.

The court held that the use of matches or the act of smoking was in no way incidental to the employment and that the injury did not arise out of the nature of the employment.

HILL-LUTHY COMPANY vs. THE INDUSTRIAL COMMISSION, Illinois Supreme Court, No. 32,089, January 24, 1952.

Failure of Employer to Supply Filters

A paint sprayer worked for about two years for his employer. The work consisted mostly of spraying with red paint. He was supplied with a mask which he wore part of the time.

The employer did not supply him with new filters for the mask and in time they became clogged and the employee was forced to work without one. As a result, the employee began to suffer from fatigue, loss of weight, difficulty in breathing, and loss of appetite. He was forced to leave his employment. About two months later, he was examined by a doctor who found that the claimant was suffering from advanced pulmonary tuberculosis.

The employer was forced to pay an award of permanent compensation after first rejecting the court's ruling.

JACQUES vs. FARMERS LUMBER AND SUPPLY COMPANY, Iowa Supreme Court, No. 47,838, April 4, 1951.

Asthma—Not Compensable

A shaper of chemically treated rubber, after about 1 and one-half years in the company's calendar room, claimed that the fumes were irritating his nose, throat, and lungs and that as a result of these irritations, an asthmatic condition developed.

The court held that the employee was not entitled to benefits under the Maryland Occupational Disease Act, because under the Act the job of the employee was not one in which the hazard of the disease is characteristic; this being a prerequisite to recovery under the Act. There had been no evidence of a similar case in which asthma had been the result of such employment.

KELLY-SPRINGFIELD TIRE COMPANY vs. ROLAND, Maryland Court of Appeals, No. 102, March 15, 1951.

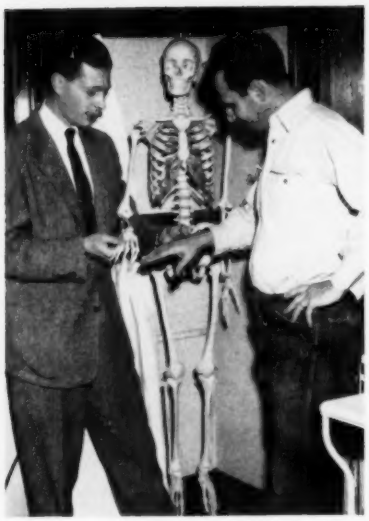
Wages From Substitute Employment —Not Compensation

A glass cutter of more than 30 years' experience, who lifted approximately 20 thousand pounds of glass each working day, suffered an acute pain in his back one morning.

On his vacation, he visited Johns-Hopkins Hospital and was told that he had a severe disc injury. Upon return to his job, he asked to be changed to light glass work and continued doing the lighter work for another year. At that time he was forced to quit glass work altogether and take a job as night watchman with his employer.

His pain continued and he filed for compensation. The court found that he was 72 percent permanently disabled. The employer immediately started an action to have his night watchman's salary deducted from the total award of 400 weeks. The court ruled further that wages paid to the injured for his work as a night watchman could not be considered in the nature of compensation or given credit on the award.

MOTTET vs. LIBBEY-OWENS-FORD GLASS COMPANY. Louisiana Supreme Court, No. 40,183, January 14, 1952.



Skeleton In Closet Becomes Medical Aide

CONTRARY to tradition, it's not always unfortunate to have a skeleton in the closet. This is especially true at the Armstrong Cork Company's floor plant in Lancaster, Pa.

In a move to better the understanding of bone injuries among the 4500 workers under his care, Dr. Harvey L. Lehman, plant physician, recently ordered a plastic model of a human skeleton for the plant dispensary. It hangs in one corner of the dispensary where he can readily refer to it in explaining a bone injury to a patient.

Seeing Is Believing

When an employee suffers a slipped disc, a fractured rib, or a similar ailment, Dr. Lehman shows the patient the similar part on the skeleton. Patients say the explanation using the plastic skeleton is easier to understand than one with an X-ray picture. Although the model has been in use only a short time, the physician has noticed that already the employees grasp the nature of the bone injuries more quickly and are better equipped to take care of their injuries after treatment.

Picture by courtesy of Armstrong Cork Co.

From Rat Poisoner To Wise Owl

SAFETY, like politics, makes strange bedfellows it has become clear with the enrollment by the Wise Owl Club, industrial eye safety organization, of its first rat poisoner.

Membership in the Wise Owl Club, sponsored by the national Society for the Prevention of Blindness, is limited to workers who have actually saved their eyesight by having worn proper eye protection when otherwise blinding accidents took place. Most members qualify at drills, presses, lathes or other machines of movement.

Loose Stone—Whoops!

Early this year, however, when Franklin Delano Rosa was removing prebait stations from a stone wall at the Lihue Plantations, Kauai, Territory of Hawaii, a stone loosened and he pitched forward, head foremost. The safety goggles he was wearing struck against a sharp protruding rock and saved him from what Koon Ye Ching, plantation director, says would certainly have been lost vision.

5,123rd Member

James E. O'Neil, director of industrial services for the National Society for the Prevention of Blindness, enrolled Rosa as the 5,123rd Wise Owl with this statement:

"Where You Least Expect"

"This proves again that eye accidents will happen where you least expect them and that there is room for a Wise Owl chapter in every industrial and commercial safety program."

Details concerning establishing a Wise Owl chapter may be obtained by writing Mr. O'Neil at the National Society's headquarters, 1790 Broadway, New York 19, N. Y.

Summer Safety Courses

NEW York University's Center for Safety Education will offer a program of courses in driver and safety education during the summer months, Dr. Herbert J. Stack, director of the Center, has announced.

The courses are designed to provide driver educators with the background necessary for professional advancement as well as to help them meet certification requirements in the various states, Dr. Stack said. Credits earned can be applied toward the requirements for a master's or doctor's degree in safety education.

The Program

The program will include courses on driver education and traffic safety in secondary schools; advanced problems and practices in traffic safety and driver education; principles in accident prevention and safety education; psychology in safety education and accident prevention; and organization and administration of safety education.

Further information concerning the program may be obtained from Edward W. Pepyne, driver education consultant, Center for Safety Education, New York University, Washington Square, New York 3, N. Y.

Chicago Cuts Accidents

ACCORDING TO AN ANNOUNCEment by Joseph F. Stech, manager of the Greater Chicago Safety Council, commercial vehicle companies reporting to the council showed a reduction of approximately 20 percent in accident frequency in 1953 over 1952 representing an average of 15,000 vehicle miles per accident.

11,436 vehicles were reported, operating a total of 163,804,949 miles. These vehicles were involved in 10,520 accidents for a frequency rate of 6.4 accidents per 100,000 miles operated for the year 1953.

Plan to Control Switch Box Hazards

A CONTROL SWITCH, PHYSICALLY remote from a machine, being turned on while a maintenance man is repairing that machine is a frequent cause of injuries and deaths in industrial maintenance. Companies trying such methods as posting warning signs and removing fuses have failed to prevent accidents. A 10-point plan to control this hazard has been offered by Samuel Stahl.

Responsibility-"Key"

1. Make each worker responsible for his own safety by providing him with his own padlock, either combination or key-type.

2. Issue only one key for each lock. The supervisor, however, should keep a master list of key numbers, and the extra key to each lock in his department. But the extra keys should never be loaned out for any reason. Keep extra copies of combinations, where combination padlocks are used, in the hands of a single supervisor.

3. If a supervisor uses the extra key during emergencies, the old lock and extra key should be destroyed and replaced. This precaution eliminates the possibility that the original key may turn up and the safety padlock be unlocked at the wrong time.

Check and Double-Check

4. Check to see that no two locks and keys are the same.

5. The company should purchase all padlocks for its employees, rather than let them supply their own.

6. Establish a careful clearance policy when two or more workers, or departments are involved. Faulty clearance systems often cause casualties even though every man has his own padlock.

7. Require each man to attach his own padlock to a switch control, even though it is already locked. (Steel tongs should be attached to switch boxes to accommodate more than one lock. This can consist of two pieces of ⅛-inch metal with the necessary number of padlock shackle holes.)

8. Impress each employee that even though someone else has already locked the controls, he will not be protected unless he attaches his own padlock.

9. Prevent men going off a job at the end of a shift from removing their locks until those on the next shift have attached their locks.

10. Identifying individual padlocks is suggested in large plants where the controls may be some distance from the point of repair.

Working in a
DUST
BOWL?
YOU NEED . . .
DUPOR No. 24
The U.S. Bureau of Mines approved respirator that *filters the air and makes it clean!* 24 square inches of filtration area makes breathing a breeze! For those who must work in dusty places there is nothing quite like Dupor No. 24. Get details! Order sample today, $3.00 postpaid.
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"Respirators for Industry since 1894"
(For full details, use Key # T-12 on free Inquiry Card on page 71)

SAFETY ACHIEVEMENTS

THE BALTIMORE & OHIO RAILROAD has received an award based on a comprehensive program designed to reduce accidents not only among railroad personnel but among the public at large. Outstanding features of the B & O's continuing safety campaign include: 1. A program designed to assist teachers in educating pupils to be safe automobile drivers —carried out in the 13 states served by the B & O; 2. A special survey of motorists' driving habits at rail grade crossings. A total of 14,824 drivers were checked in 11 cities served by the railroad; 3. Project designed to eliminate accidents in the home which took the form of a combination cookbook with safety hints; 4. A program designed to curb juvenile trespassing on railroad property. Part of this project included the showing of specially-made safety films in 2774 schools before 1,110,496 children. A half-million safety booklets and 30,000 safety buttons were distributed at these showings.

THE GREATER CHICAGO SAFETY Council has honored local industrial organizations who have maintained or improved their accident experience in 1953 over 1952, both in the matter of frequency and severity. An important result of the annual contest was the reduction in the number of man days lost in 1953 over 1952—a matter of some 13,960. A total of 565,398,971 man hours was reported for 310,955 employees, with 4,123 lost-time accidents. The number of days lost was 360,512. The frequency rate was 7.2 accidents per one million man hours worked, and the severity rate was .65. In both cases there was a decrease over the 1952 experience of 7.3 and .66.

THE AMERICAN WELDING & MANUfacturing Company of Warren, Ohio commemorated 365 days of operation without a lost-time accident, representing over 1,600,000 man hours of work. The company holds the current world record in the metal section of heavy fabricating for plants of over 500 employees for its over 3,000,000 man hours worked without a lost-time accident from March, 1948 to December, 1951.

THE AWARD OF HONOR HAS BEEN given by the National Safety Council to the Chrysler Detroit Tank Plant in Centerline, Michigan for their 1953 safety record. Qualification for the award requires that a company not only better the average for the industry but their own past record as well. Frequency and severity of accidents are both taken into consideration. The tank plant's accident frequency was 82% better than the average for the entire iron and steel products industry. Severity of accidents was 66% below the national average. In addition, their own average for the past 3 years was improved by 75% and severity was reduced 70%.

AN OUTSTANDING SAFETY RECORD of 29 months without a disabling injury by employees of Conduit Fittings Division, Pressed Steel Car Company, Inc., was recognized in a special ceremony held in the division plant. Awards were presented to the division by the National Safety Council and by the insurance carrier. Each employee received a gift from the company in recognition of their cooperation in the prevention of accidents.

HAVING RECEIVED SAFE DRIVING awards from the American Trucking Association, Ray Heffelfinger and Forrest Leies, employees of Rubbermaid Products, may be able to claim the national safe truck driving record with a two man no-accident record totaling 62 years! Leies began his driving career with Wells-Fargo in 1915 and has driven trucks since without an accident, a total of 36 accident-free years (which could be a national record, according to the Association). Heffelfinger has racked up a total of 26 years without an accident. The men received cards Nos. 21 and 22 for safe driving—only 20 other drivers have been issued cards for 20 or more years of safe driving.

THE NATIONAL SAFETY COUNCIL has announced nine awards for outstanding plant safety to Reynolds Metals Company. They include one Award of Honor, six Awards of Merit, one Certificate of Commendation and one President's Letter. The awards were presented for outstanding achievements in accident prevention in Reynolds plants.

The Award of Honor went to the aluminum firm's South Plant in Richmond, Virginia. The Award of Merit was given the Reynolds North Plant in Richmond, the Jones Mills operation at Jones Mills, Arkansas, the facility at Phoenix, Arizona, and the subsidiary plants in Sheffield, Alabama and New Castle, Delaware. The Certificate of Commendation went to two plants in Louisville, Kentucky—Plant 5 and Plant 10, while the President's Letter was awarded the Reynolds operation at Vernon, California.

MR. W. T. ROGERS, SAFETY DIrector of Ebasco Services Incorporated, has completed a 20,000 mile tour of the United States, during which he visited 21 of Ebasco's large construction projects and presented fifteen safety achievement awards. The awards, presented to construction projects which complete an award period of one year with an injury index 25% below the national average for the entire construction industry, were made to projects located in 14 states.

The Webster Steam Electric Station of The Houston Lighting and Power Company received the annual Ebasco Gold Award for outstanding performance in the prevention of accidents. To merit the award, the construction organization achieved an injury index 80.97% below the national average for the entire construction industry during the award year 1952–53. During the award period the project had an average working force of 193 men, worked 400,205 hours with no fatalities and only three lost time accidents, which resulted in the total of only 21 days lost from work. A silver plaque was awarded to the Lake Creek Station of Texas Power & Light Company.

PLANT #3, DIEBOLD, INC., HAS BEEN honored by the National Safety Council for its perfect safety record for 1953—267,046 man-hours worked without a loss-time injury—good for second place in the Printing & Publishing Section Safety Contest, Group A.

FOR THE SECOND TIME IN THE COMpany's history, Monsanto Chemical Co. plants have completed an entire month without a lost-time accident.

The downward trend in accident rate which carried through 1953 brought that year's final figure to 1.30—another company record and second low among the largest general line chemical firms. Overall average for the chemical industry in 1953 was 3.69, as reported by the Manufacturing Chemists' Association.

FOR HAVING EFFECTED A 40% NET reduction in accident and frequency rates for a two-year period, the Transportation Corps of the U. S. Army has received the Award of Honor from the National Safety Council. One of four major commands so honored, the Transportation Corps was the only Army Technical Service to win the award for 1953.

LOCKHEED AIRCRAFT SERVICE'S Burbank base has won the Sweepstakes Trophy awarded by the Greater Los Angeles chapter of the National Safety Council. This marks the first time that an aviation organization has been recipient since the award was put into competition five years ago.

The Burbank installation in 1953 worked more than 4,000,000 man hours with an accident frequency rate of 0.79, as against 1.55 in 1952. The national average for the transportation industry is 14.94. A field of 312 companies, representing more than 500,000 employees and 879,000,000 man hours exposed to possibility of accidents was in the competition.

FINAL STATISTICS RELEASED BY the National Safety Council, awarded first place in Division "B" of the 1953 Aeronautical Industries Safety Contest to The Oliver Corp., Aviation Division, Battle Creek, Mich. Oliver's .84 lost time accident frequency rate was considerably smaller than the Division "B" average frequency of 4.53 for the sixteen aircraft companies competing. First place among aircraft plants in Division "A" went to Douglas Aircraft Co., Inc., Santa Monica, Calif., with a frequency of .74.

IN THE rubber section safety contest conducted by the National Safety Council for 1953, United States Rubber Co. had an outstanding record with five first places, one second and one third, out of 151 factories competing.

Records are based on the accident rate, and companies are grouped according to their average monthly

GREATER PERSONNEL PROTECTION THAN EVER BEFORE

safety engineers, industrial hygienists, industrial engineers and production men are

*REPLACING CARBON TETRACHLORIDE

with FINE ORGANICS' 'SAFE-TEE' SOLVENT

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(low toxicity—high flash)

and are safe-guarding personnel from nausea, vomiting, abdominal cramps, headaches, dizziness, jaundice, loss of memory and the more harmful effects on the lungs and the liver.

Combined with the exceptional safety features is the extreme **CLEANING AND DEGREASING** effectiveness of **F.O.-128.**

ADVANTAGES OF F.O.-128

- Minimized toxicity — fifteen times more safe than carbon-tetrachloride.
- High flash point reduces fire hazards.
- Will not produce dermatitis.
- Perfect for cleaning electrical and mechanical equipment without damage to surfaces or insulated components.
- Zero residue on drying.
- May be used in process cleaning for pre-paint or pre-plate operations.

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*See July 1952 issue of Industrial Hygiene and Occupational Medicines

Write to Dept. "B" for FREE technical bulletin "How to Clean Electric Motors."

AVIATION INDUSTRIAL DIVISION

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man-hours. The winning U. S. Rubber Co. plants are: Mishawaka, Ind.; St, Jerome, Que.; Milan, Tenn.; Naugatuck, Conn.; Passaic, N. J.; Burlington, N. C.; Sandy Hook, Conn.

FOR achieving a 17 percent reduction in accidents despite a 19 percent increase in man-hours worked during 1953, Brigadier General Robert G. Lovett personally has commended the District Engineers of the East Ocean Division.

Employing some 25,000 persons, the Division in 1953 experienced a man-hour increase from 40,498,932 to 49,761,705 over 1952, but at the same time an overall decrease in the number of accidents from 823 to 679. The number of days lost as the result of injuries was reduced 51 percent and fatalities were cut from 11 in 1952 to five in 1953. The frequency of injuries was reduced 27 percent and severity was reduced 60 percent.

"Shell on Head— We're Not Dead"

THAT'S the motto of Mr. Mike Sikurenic, of Johnstown, Pennsylvania a Slagger at Bethlehem Steel Company Plant and 200 other men in various parts of the country. These 200 men, members of the very exclusive International Turtle Club, have something important in common. Their lives were saved because they were wearing safety hard hats. They were adjudged eligible for membership in the Turtles' only because they would have been killed at the time of their accidents had they not been wearing their hard hats.

The presentation of the 200th Membership in the Turtle Club was made during the National Safety Congress in Chicago. On hand to witness the presentation were Robert Gidel, Director of the Metal Section of the National Safety Council; E. W. Bullard, President E. D. Bullard Company, Sponsor of the Turtle Club in the United States, W. W. Brandt, Director of Safety for Bethlehem's Johnstown Plant who accepted the certificate for Mr. Sikurenic, and Carter Kendall, Director of Safety Bethlehem Steel Company.

Started in 1930 by a Lumber Company Safety Director, the Turtle Club became active in the United States in 1950. Membership is made up from all types of industry. Turtle Club Members as survivors of otherwise fatal accidents are proving, to the gratitude of Safety Engineers, to be enthusiastic boosters for wearing hard hats.

Design for Safety

SAFETY BEGINS WITH THE engineers who design the vehicles and production machines, according to Ross A. McFarland, associate professor of industrial hygiene at the Harvard School of Public Health, in an article in a publication of the American Society of Mechanical Engineers.

"The 'human engineering' approach to the solution of the accident problem is to build machines and working areas around the operator, rather than to place him in a setting without regard to his requirements and capacities."

How important the need is, according to the author, is indicated by the fact that accidental injury is the leading cause of death for persons between 1 and 24, and the second leading cause of death for those between 25 and 44 years of age. Various studies and surveys point out that many mechanical accidents are caused by excessive demands placed on the operator by reason of improper design.

The article calls for the design and placement of controls and levers to permit rapid and accurate judgment and movements, with particular attention being paid to the shape and color coding of knobs, the radius of knobs and winding handles, the gear ratio, and the amount of friction and inertia. Important factors relating to the operation of controls are listed as: 1. Location; 2. Direction of movement; 3. Speed required in relation to rotary and wrist movements; 4. Rate of movement from point to point; and 5. Rate and accuracy of positioning responses.

It's Never Too Cold For Beryllium Copper

A TWO-YEAR study completed at the University of Pennsylvania discloses that mechanical properties of beryllium copper are able to withstand extreme temperature conditions as low as minus 300 degrees F.

The study shows that the alloy in some respects displays improved performance in the subzero range.

These findings are expected to have important bearing on the types of design materials used in equipment operating in intense cold. Such equipment would include aircraft parts and instruments, radar and devices for handling refrigerants and liquefied gases.

"Tests Prove . . ."

Conducted under the direction of Dr. Robert M. Brick, head of the University's Department of Metallurgical Engineering, the study was sponsored by The Beryllium Corporation, Reading, Pa. Tests were confined to commercial types of wrought and cast beryllium copper alloys, marking the first time low-temperature studies have been made upon commercial grades of the alloy.

Among important properties measured were tensile and impact strengths, elongation, and elastic modulus. Results indicate that beryllium copper performs with unhampered and even heightened efficiency under subzero conditions that generally cause failure in other standard design materials.

Details of the two-year study, along with conclusions and interpretations of the findings, are available as a four-page Technical Bulletin from The Beryllium Corporation, Reading, Pennsylvania.

Learning..... the hard way

ONLY 15 MINUTES . . .

THAT'S ALL THIS PUNCH-PRESS JOB was supposed to take, and that's why, management explained, no guard was provided. After all the job was a short one, and it was needed in a rush. Why go to all the trouble?

Well, the job was a short one all right. In less than one second of the 15 minutes expected to complete the job, the operator had caught her hand in the unguarded press and lost 3 fingers! Her mutilated hand was a rather high price to pay for the chance she and her employer took, but they paid it. Rush job? Well, accident prevention has no time dimension!

KEEPING PACE!

AN EMPLOYEE WAS MOVING A burning salamander from one place to another on a construction job. The handle of the salamander broke and burning kerosene spilled over the floor, igniting the sub-flooring and damaging the concrete ceiling. Although a sprinkler system was being installed it had not yet been completed. Sprinkler heads fused, but there was no water in the system!

Fire protection must keep pace with construction, not lag behind, if the danger of fire damage is to be stopped or controlled.

COMPLICATIONS SET IN!

DURING THE REPAIR OF A CRANE, mechanics left a bearing cap on the trolley bridge. A crane-man, not knowing that this bearing cap was there, trolleyed the crane and knocked the cap off the bridge. The cap fell near an inspector below and startled him. He jumped, slipped, fell and struck his head on a railing, fracturing his skull.

Again, this accident is a sample of the little things which mushroom into accidents. The mechanics should have been extremely sure to clear the crane track before the crane was operated, and they have been so instructed now.

WHERE WAS THE FOREMAN?

EIGHT MEN WERE WORKING ON A wooden scaffold suspended about 100 feet in the air. The scaffold was supported by 4 steel cables, one at each corner, and at the point where each cable was attached to the scaffold, there was a hand operated cable hoist.

The 4 men who were operating the hoist winches started a race to see how fast they could turn the winch handles. The platform tipped, one cable became very slack and when the man who was turning the handle tried to increase his speed, the cable crossed in the drum. An effort was made to straighten the cable by hitting it with a hammer. The hammer struck the catch holding the ratchet allowing the cable to unreel. When the cable unreeled itself fully it broke. Three men plunged to their death on some steelwork, 70 feet below. The remaining 5 men clung to the scaffold until they were rescued.

The tragic result of this bit of "horseplay," if taking chances with 8 men's lives can be called that, is an example of what can happen when supervision relaxes. The facts that 4 grown men could indulge in such dangerous nonsense, that 8 other men couldn't shout loudly enough to get the 4 culprits to stop their play, and the fact that the men were not sobered immediately when the scaffold began to tip, are incredible enough. But why no foreman was near to oversee or, once the mishandling had begun, to stop it, is indefensable.

JUST A LITTLE BIT OF LINT!

TEXTILE EMPLOYEES HAD DIFFIculty starting and stopping a drying drum. The plant electrician was called and was checking the toggle switch, located on a steel column, when a spark ignited lint that had accumulated on the column. The fire flashed across the entire ceiling of the building, and flames entered the duct work of the machines, were drawn to the outside of the building, and ignited the roof. Apparently motors in the exhaust ducts were heavily covered with lint, because subsequent investigation revealed evidence of fierce burning.

The operation of a number of sprinklers held the fire in check until it was extinguished by the public fire department.

Good housekeeping practices demand that lint accumulations be removed regularly. They are a vital part of fire prevention, as well. Remember this: a clean plant seldom burns!

THE CHANCE-TAKER

A MECHANIC WAS CLEANING A warm motor with kerosene. The bucket of kerosene caught fire. The mechanic received first and second degree burns of his face, neck, hands and wrists. Even though kerosene has a higher flash point than many other petroleum products, it should be treated carefully. After all, it is flammable and kerosene vapors are highly explosive. No warm motor should be cleaned with any remotely flammable cleaning agent . . . it just doesn't pay to take the chance, as this mechanic found out.

WHEN IS A GUARD NOT A GUARD? . . .

WHEN IT'S INCOMPLETE, INADEquate, or tampered with. Recently a woman operating a circular saw lost a finger when her hand was caught by the saw. The saw blade hit a knot in the wood she was cutting, and threw her hand against the saw.

A guard had been provided, but investigation showed that part of the section which covered the saw had been filed away to permit a bigger bite into the work being done. The bigger bite proved to be into the worker's hand.

It is not clear whether the employee or the employer was responsible for the tampered guard. In any case, it proves that guards are not to be changed for convenience's sake. They're not put on simply to be nuisances. If a change is called for, it must be made by qualified engineers or other personnel to be sure that it retains its chief quality—protection.

THE OLD STORY

IF WE HAD A PAIR OF GOGGLES FOR every story related in this column about accidents in which protective equipment was provided but not used, we could provide every worker in the country with goggles. Unfortunately, that wouldn't necessarily mean that they would all be worn and we would probably have to continue to publish stories such as this one.

An employee was repairing a valve on an ammonia solution line, when, due to some back pressure in the line, his face was sprayed with the solution and his eye was burned. Goggles and masks had been provided but this worker didn't feel the need of them till he had been burned.

The only answers to this problem of getting workers to wear protective equipment, seem to be instruction, supervision, and enforcement. Each employee should be instructed to wear the right equipment for the right job, he should get a chance to try it on, his gripes about discomfort should be listened to, his use of the equipment should be watched over by competent foremen, and his disregard for the rules about wearing it should be dealt with immediately. This is a large responsibility, but it's worth undertaking.

A WARNING ISN'T ENOUGH

A PAINTER WAS AT WORK IN A plant, painting from a ladder near the wheel track of an overhead traveling crane. Both the painter and the crane operator had been warned that the crane was not to approach nearer than 20 feet to the ladder. Apparently the painter left it to the crane operator to obey the verbal instructions and didn't keep his eye peeled for the crane's movements. Apparently, also, the crane operator forgot about the painter and his instructions. At any rate, the crane struck the ladder, knocked the painter off it; and, he fell onto machinery below, receiving injuries from which he eventually died.

Here is further proof, if any is needed, that verbal instructions should be supplemented with positive safety measures as often as possible. In this case, putting stops on the crane wheel tracks would have prevented the crane from coming dangerously near the man on the ladder.

WHAT CAN'T REACH YOU . . .

CAN'T HURT YOU. IF YOU WEAR protective clothing for whatever job you are doing, and it's the proper protective clothing, the hazard you're worried about can't get to you. This applies to skin irritations, too.

In this instance, 2 men were clearing an irrigation ditch, and contacted poison ivy which affected most of their bodies. They neglected to take every precaution to avoid contact with the plant. They didn't wear long sleeves and gloves, or use protective creams, they didn't keep out of the smoke of burning brush, they didn't wash off their tools with kerosene, and they didn't wash their bodies or their clothes with strong laundry soap. They should have.

Look at the Wood

(Continued from page 16)

the several indications of cross grain on both surfaces and edges. The use of scribes and even splitting tests may be necessary in order to determine the steepness of slopes of grain which are indicated by the visible characteristics on the surfaces of ladder parts.

Information on the characteristics and detection of cross grain is included in Forest Products Laboratory Report No. 1585, *Guides to Determining Slope of Grain in Lumber and Veneer*, which is available without charge.

Compression Failures—Dangerous

COMPRESSION FAILURES. Less common than cross grain, but nevertheless as important, are compression failures. Compression failures comprise zones in which the fibers have been seriously damaged or buckled, so that strength is greatly impaired. They may be caused in the living tree by the bending that takes place in severe storms, or in logging when a tree is felled on uneven ground. Fortunately, the incidence of compression failures is not high, but regular inspection to detect them is necessary because of their hazard to the safety of users.

Compression failures are evidenced by buckling of the fibers. Occasionally, the buckling is well defined and can be seen on surfaces of pieces without magnification; but more frequently, the compression failures are so small that special techniques are necessary to detect them adequately.

It is possible, nevertheless, to detect the presence of the extremely small compression failures even though they are not visible with optimum lighting on planed surfaces of lumber. The presence of compression failures causes fiber breakage on sawn end-grain surfaces of lumber. Examination to detect roughening of end-grain surfaces is therefore an effective way of inspecting for compression failures.

The technical information on compression failures has led to recommendations for practical methods of detection in ladder rails. The methods include ordinary visual inspection of ladder rails on the end grain for the fiber breakage, already described, and on the sides and edges for visible compression failures which are greater than microscopical sizes. Incident lighting by a reflector spot bulb that is focused at an angle of about 20° to the surface has been found to facilitate detection of visible compression failures. Slight magnification, such as can be obtained with a reading glass, aids in the detection of the visible compression failures.

Compression failures frequently are made readily visible after clear lacquer, shellac, or varnish has been added to the surfaces. The application of non-swelling liquids also makes more readily visible the small, but not microscopic, compression failures. However, since the most commonly available non-swelling liquids are somewhat toxic or flammable, or both, such materials should be used only in areas of good ventilation and freedom from danger of being ignited.

Abnormal Wood Growth

COMPRESSION WOOD. Compression wood is an abnormal type of wood growth occurring in softwood species, principally on the under side of leaning trees. It is generally denser than normal wood, and usually distinguishable by very wide and eccentric annual rings, a lack of contrast between springwood and summerwood, and by yellow-colored summerwood.

Structurally, the wood fibers that constitute compression wood differ from normal wood in that the fibrils are oriented at a greater angle with the length of the fiber. Normal wood exhibits very little longitudinal shrinkage in seasoning, but compression wood because of the greater fibril angle has a very significant longitudinal shrinkage. Hence, when present with normal wood, as is commonly the case, compression wood is apparent by the bowing of the piece due to this shrinkage differential, making the lumber unsuitable for critical uses such as ladders. Naturally, much of the lumber containing compression wood is eliminated early in the inspection process because of warping, and compression wood is limited in specifications for lumber grades.

Compression wood is less stiff than normal wood, and is less satisfactory and reliable where strength is important. The compression wood fibers differ in degrees of abnormality, from the borderline forms that differ only slightly to the extremely abnormal forms. Fortunately, the most extreme forms are readily detected by ordinary visual inspection. The greater proportion of summerwood over springwood facilitates detection of compression wood in ladders.

Simple Detection

A simple method has been developed as a guide in the detection of compression wood without the use of microscopical examinations. Because of minute checks in the fiber walls of compression wood thin cross sections of the abnormal summerwood are opaque while those of normal summerwood are translucent when held against a bright light.

Because of the importance of recognizing and meeting the challenge of safety in ladder use, the owner should not overlook the possibility of checking the quality of the ladder or ladders purchased. To permit such inspection, ladders are sold unpainted; and they are usually left unpainted to facilitate subsequent periodical inspection. Many of the inspection techniques discussed can be used in the visual inspection and appraisal of finished ladders. Such inspection is to be highly recommended, because unfortunately some defects get into completed ladders, as evidenced by an analysis of ladder failures. The most common defects observed in ladder parts leading to failure have been cross grain and compression failures.

It is, of course, obvious that, once a ladder is manufactured, there can be no subsequent change with respect to the natural characteristics

present in the wood, such as knots and cross grain.

However, ladders should be inspected frequently to determine possible evidence of damage as a result of lack of reasonable care in handling, to determine whether repair is needed, or whether they have become otherwise unserviceable. Good maintenance practice requires that the joints between steps or rungs and side rails be kept tight, that hardware and fittings be securely attached, and that movable parts operate freely. Rope should be replaced when necessary, and metal bearings of locks, wheels, and pulleys should be lubricated. Attempts to repair broken side rails or rungs are to be discouraged. If a side rail is broken, either the ladder should be discarded, or a complete new side rail of proper size and quality should be installed.

The question is often asked, should ladders and ladder equipment, including step ladders, single and extension ladders, scaffold planks, swing stages, and trestles, be painted. What are the advantages and disadvantages of painting?

Painting Wood Ladders

New ladders, except certain specialty items, are sold in an unpainted or unfinished condition. In this condition, the ladder can readily be checked for cross grain, compression failures, and quality of wood. Many users prefer to leave the ladders unpainted throughout their serviceable life to permit continued recurring inspections. This practice is safe in that there need be no deterioration of the wood with time or age if it is properly stored when not in use.

For users who desire a finished ladder while retaining the natural features of the wood, a transparent finish such as varnish, shellac, or a clear preservative is recommended. Such a ladder can be inspected from time to time the same as an unfinished ladder. Some State safety codes require transparent finishes or that ladders be left unpainted for these reasons.

On the other hand, when adequate initial inspection has been made, some companies find it desirable to paint ladders and maintain them in a painted condition. Painting may increase servicability and reduce splintering, as well as improve appearance. It is only to be recommended, however, after adequate initial inspection has been made by competent organizations that have thorough inspection and maintenance programs. Painting itself does not increase durability or resistance to decay.

Safe Ladder Storage

Wood ladders, when not in use, should be stored under shelter and in a place where there is good ventilation. They should not be stored near radiators, stoves, steam pipes, or other places subjected to excessive heat or to dampness. Further, they should be supported so that the weight of the ladder is distributed, and sag will not occur. For example, if a long ladder is hung from two hooks near the end, considerable sag at the center will take place from the weight of the ladder. If so hung for an extended period the ladder may become permanently sagged. Likewise, ladders carried on vehicles should be adequately supported to avoid sag, and fastened to minimize damage in transport.

Wood does not deteriorate with age, when protected from adverse exposure and decay. Hence, wood ladders properly used, cared for, and maintained will have long life and give continued service over many years.

From an address delivered at the 41st National Safety Congress.

Pictures by courtesy of Forest Products Laboratory.

Look for the Next Ladder Safety Article in August!

a little thing like a salt tablet* can prevent a big thing like accidents

It's an established fact that as the heat curve goes up, so does the accident rate. Salt sweated out must be replaced, or else your workers become easy victims of *heat fatigue*. When this happens, carelessness results and costly accidents can occur.

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Associate Editor
Jacob A. Goldberg, A.M., Ph.D.

Public Health Meeting

EXPERIENCE WITH THE INOCULATION, NOW GOING ON of one and one half million children with the Salk vaccine for poliomyelitis will be presented at the 82nd Annual Meeting of the American Public Health Association in the Memorial Auditorium, Buffalo, N. Y., October 11 to 15.

The session on polio vaccine will be one of 75 scientific sessions to which 400 speakers will contribute, according to Dr. Reginald M. Atwater, the Association's Executive Secretary. Another will consider the impact of suburbanization on public health.

The Annual Meetings of the American Public Health Association have served to bring new knowledge of disease prevention and health protection to public health workers everywhere. Five thousand or more health authorities from all parts of the free world will assemble to gather information about the latest developments in public health practice and techniques for application in their communities back home.

"A year of work on the part of the Association's 13 Sections and 38 related organizations goes into the program planning and preparation," Dr. Atwater said. "Public health has a wide range," he added, "and this is indicated by the scope of the Buffalo Annual Meeting program. It will include sessions on chronic diseases; carcinogens; viral diseases; enteric infections; air sanitation; radiological health; fluoridation; the newer insecticides; nutrition services in institutions; new developments in food, water and milk protection and sanitation; improving medical and hospital care; health supervision of well young children; care of handicapped children; industrial health."

Local arrangements for the Annual Meeting are being made by a committee under the chairmanship of Dr. Berwyn F. Mattison, Health Commissioner of Erie County.

APCA Elects

ELECTION OF GORDON P. LARSON TO THE PRESIDENCY of the Air Pollution Control Association was announced at the Association's 47th Annual Meeting. Mr. Larson served as first Vice-President of the Association during the past year and has been one of the nine directors for the past two years.

The Association's new President has led a smog reduction program in Los Angeles County which has attracted international attention to the work of his organization. He and his technical staff pioneered in new fields of research, leading to the most stringent regulations for the control of dusts, fumes, vapors and gases of any industrial area.

Other officers elected were five directors:

Basil Horsfield, Vice President, Reynolds Metals Corp., Sheffield, Alabama.

Benjamin Linsky, Supervising Engineer, Bureau of Smoke Inspection & Abatement, Detroit, Michigan.

Herbert H. Ulrich, Chief Smoke Regulation Engineer, Omaha, Nebraska.

Elmer P. Wheeler, Industrial Hygienist, Monsanto Chemical Co., St. Louis, Missouri.

H. A. Belyea, Industrial Hygiene Engineer, Ontario Department of Health, Toronto, Ontario, Canada.

The week long conference of air pollution control authorities heard papers delivered by experts in every field of atmospheric contamination and control and it served as a medium for exchange of information between all agencies engaged in reducing air pollution.

PHOTOGRAPH BY RICHARD BEATTIE

What we still don't know about cancer

—and one of the reasons why

IN THE PAST FEW YEARS, our knowledge of the nature of cancer, and how to treat it, has grown encouragingly. Patients, who would have been considered hopeless cases even five years ago, today are being completely cured. And even those who apply for treatment too late can usually live longer—and less painfully—because of modern palliative treatment.

All the same, there have been defeats as well as victories. We do not know—to take a single example—why so many more men are now dying from cancer of the lung. In 1933—just twenty years ago—lung cancer killed 2,252 men; in 1953, some 18,500. That's a great increase—which even our expanded population, and other known factors, can't possibly account for in full.

Well, why haven't we found more of the answers to cancer?

Not only because cancer is an immensely complex problem: difficult to diagnose, and difficult to treat; challenging to the best research minds.

All that is true enough. But there is another reason: *we do not* have enough money.

Last year your gifts to the American Cancer Society were more generous than ever before. But they were not enough.

You gave the Society almost twenty millions to fight a disease that—at present death rates—will kill twenty-three million living Americans.

Less than one dollar for each American destined to die from cancer. Much more is needed for research, for education, for clinics. Won't you please do *your* part . . . now?

American Cancer Society

Cancer
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strike back
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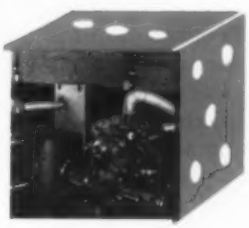
DUST & FUME CONTROL SERIES
last articles in August and September

THEY DIDN'T GAMBLE

on 1 centralized system

or 7 dust collecting units



INSTEAD THEY CONSULTED WITH EXPERTS before installing their dust control equipment.

Because the selection of dust control equipment may be made by an owner of a small shop or the management of a large plant only "once in a lifetime" it is sometimes approached with reluctance. It is manifestly impractical for the individual owner or many plant managements to become thoroughly familiar with dust control theory and practice, and to know that the selection of equipment is often a very simple, very non-technical operation when the basic theories are known.

Consultation with qualified personnel made possible an intelligent selection of collectors to gather dust from 7 grinders in the shop of this leading producer of precision taps. The management of the shop refers to itself as a "job-shop" in that it welcomes orders for special taps in lots of one or two taps as well as in the larger production lots. This means that the use of the 7 grinders is on a strictly intermittent basis with the total usage throughout the day being completely unpredictable.

Yet these grinders were installed in a row along one wall of the shop which made it appear at a glance that all could be tied into a single system. The single system collector which would handle all 7 grinders was available from the same dust control manufacturer that could also offer individual 1-per-grinder unit type collectors. Moreover, the single collector was available as a standard stock pre-tested unit, the same as the small unit-type collectors. The problem was quickly broken down into its essential elements somewhat as follows:

The amount of air required right at the source of dust totaled about 3 thousand c.f.m. Since the plant is located in the far northern zone where low winter temperatures prevail over a longer period of the year, it was mandatory that the cleaned air be returned to the interior of the shop rather than wasted by escaping out-of-doors.

Because of the location and also to avoid interfering with current production, the customer decided that his own maintenance department would install whichever system was decided on.

The Case for the Centralized System

One single, self-contained dust collector with cyclone separator and second stage filter to permit return of the cleaned air to the working space would be installed at

the end of the row of grinders. A conventional header pipe would connect to the inlet of the collector and have branches and vertical droppers to connect with the hood at each grinder. The vertical dropper has a decided advantage when the universal feature of this type of grinder is being used as it permits the hood to follow the grinding wheel to any position. In this instance, however, the universal feature of the grinder would never be used—the grinding would all be done in one position. Therefore, the vertical connection would have no advantage over a horizontal pipe.

The removal of the collected dust, the regular shakedown of the filter, and renewal of the filter on the collector would depend on the total hours the grinders were in use, but there would be only one collector to maintain. However, on the basis of installing one collector per grinder, the maintenance would have to be repeated for all 7 collectors. The single system would be supplied with an installation drawing; and all parts would bear a number to correspond with the part as shown in the drawing, thereby permitting the assembly of the piping and the installation of the entire system to be done quickly by unskilled workers.

Advantages of 7 Separate Collectors

The unit, "1-per-grinder" type of collector is likewise entirely self-contained in that each has its own cyclone separator and second stage filter to permit return of the cleaned air to the shop. Installation consists of moving the collector into position behind each grinder and fastening a short section of connecting hose—with its hood—to the inlet of the collector. By putting the collectors on stands, the surface friction losses are reduced to virtually nothing. The collectors can be installed with the least interruption to normal operations.

Maintenance of the unit collectors—shakedown of the filters and removal of the dust—appeared to loom large until it was agreed that each grinder operator would give his collector a "morning shakedown" before starting the grinder. The collectors would be installed on stands; this would somewhat facilitate removal of the collected dust from each unit.

Less Horsepower Required

The decision in favor of the unit type collectors was made, however, chiefly because of the intermittent usage of the grinders: If only one single grinder were being used, the 7 and a half hp. motor of the single collector would be running. But in the case of the individual collectors only a one-third hp. motor would be "on." With *all* 7 grinders in use, the electrical power required would be on the basis of 7 and one-half hp. for the single system as compared with 2 and one-third hp. for the individual unit type collectors.

The possibility also existed that the arrangement of the grinders might someday be changed, or that more grinders would be added. The cost of the individual unit type collector was only a little above the cost of the single large collector with its overhead piping and branches so the management felt that the advantages were worth the difference.

Maintenance Easier Than Expected

As it has worked out, the maintenance of the individual collectors has been much easier than was even expected. The "morning shakedown" has become something of a ritual with one operator trying to "outcrank" his neighbor in speed and effect. The life of the filters under this system has been 10 months rather than the anticipated 6 months, and the collectors protect the health of the workers, the precision machinery used in the shop, and also the accuracy of the finished taps.

Photo Credit: Aget-Detroit Co.

Plutonium Cocktail

YOU can swallow more radioactive plutonium, if you want to, without physical damage than scientists used to think, according to recent tests at the Hanford Plutonium Plant, operated by the General Electric Company for the Atomic Energy Commission.

Hanford scientists discovered this by feeding plutonium in dilute solutions to 200 rats. It turned out that one-fortieth less plutonium from a given dose than previously calculated was absorbed into their intestinal tracts by the rodents.

The scientists also found they could remove some of the plutonium even after the rats had received a dose. However, agents used to remove the radioactive material were ineffective if administered as late as 30 days after the plutonium was absorbed.

Decontamination Agents

In other experiments it was discovered that almost no plutonium applied to the skin of rats penetrates unless it is in a solution "so strong it destroys the outer skin layer."

In their decontamination experiments researchers found that the best agents for removing contamination are those that also remove part of the outside layer of skin. Still to be learned is whether absorption through affected skin areas is increased in future contacts with contamination by radioactive materials.

The tests were part of a continuing health and safety program carried on at the Hanford plant, even though there never has been a serious injury caused by radioactive materials there. Stringent safety regulation and elaborate protective equipment have effectively protected thousands of workers.

Chief danger of plutonium is that, like radium, it destroys the blood-making organisms if it enters the body in appreciable amounts.

Are Your Workers

WORTH THEIR SALT?

PERSONAL HYGIENE SERIES
previous articles in May and June.

Perspiring worker goes to drinking fountain and finds tablets handy to replenish salt he has lost in working in hot area.

MEDICAL SCIENCE HAS SHOWN CONclusively that heat cramps and heat prostration are caused by the excessive loss of salt from the body through sweating. These losses have to be replaced if the body is to stay healthy.

Here is what happens when the body loses salt through perspiration. The first symptom is lassitude, followed by a loss of the will to work. Even if symptoms don't get beyond this stage, a worker becomes increasingly inefficient. As the loss of salt increases, the effort to work becomes more and more forced. The next symptom is severe dizziness, followed by muscular spasms and sharp abdominal pains.

Ancient History

The problem of heat fatigue was recognized 2 thousand years ago. The Bible mentions the symptoms of heat cramps in chapter 8 of Jonah. Records of Frederick the Great's campaigns indicate his soldiers suffered from this malady. So did gold miners of Virginia City, Nevada in 1878.

The problem has become particularly acute during the past 50 years with industrial expansion. More and more men have been employed in "hot jobs"—in steel mills, mines, foundries, etc. In 1925 Col. R. J. W. Oswald, chief medical officer of a gas company in Britain, wrote a letter to *The Lancet*, a British medical publication. He told of the abdominal cramp and exhaustion experienced by employees in retort work at the gas company. The problem became so serious that he introduced a "saline drink" for the stokers with marked success.

Col. Oswald summarized the results as follows: "Since the drink has been introduced, cramp has been

eliminated and a greater sense of well-being at the end of each shift has been obtained. The great majority of the men will have no other drink. Incidentally, the sick rate has been reduced. . . ."

Since the time of Oswald's letter, a number of thoroughly documented reports have appeared which prove conclusively the benefits derived from the additional consumption of salt in hot weather. Among these is a study made by Youngstown Sheet & Tube Company.

Salt Consumption Studies

In 1934 this company co-operated with other companies in bringing a group of specialists from Harvard University to Youngstown, Ohio to study its heat cases. This study showed that adding a teaspoon of salt to a gallon of drinking water was enough to keep the body salt up to the necessary amount.

Furthermore, salt made it possible for the body to hold the required amount of water. The men who drank plain water weighed out at the end of the experiment on an average of 5.6 pounds lighter than when starting to work. When they drank water with requisite added salt they weighed out at the end of the experiment with an average loss in weight of a little more than a pound. This proved that salt loss in sweating made it impossible for the body to hold its normal amount of water.

Now, progressive industrial plants provide salt tablets in handy dispensers near water coolers. By doing so, they cut down on lost man-hours, reduced efficiency, and costly accidents which result from heat fatigue.

A problem which has had to be overcome in the use of salt for heat relief is that certain individuals become nauseous when they take salt tablets. This nausea factor has been overcome by the introduction of impregnated salt tablets. These tablets have a controlled dissolving rate; so that the user gets immediate benefit, but is not forced to absorb all the salt into his system at once.

With the convenience, effectiveness, and lack of nauseous effects available in salt tablets, the industrial heat problem now seems readily controllable.

Perhaps the clinching argument for the use of salt tablets is their low cost. A factory can provide an adequate supply of them for less than a penny per worker per week. It's an inexpensive way to prevent lost man-hours during high-accident hot weather.

Picture by courtesy of Morton Salt Co.

Employee Mental Health

"THE issue of mental health is no longer the sole problem of the psychiatrist," reports Industrial Psychology, Inc., nationally-known psychological research organization. "Company management must now recognize its responsibility in the area of employee mental health, by providing a work environment which helps prevent mental breakdown."

Based on reported diagnoses, there are over 6½ million cases of psychosis and neurosis in the United States today. It is further estimated that there is an equal number of cases of which there is no record. A conservative figure is that one out of every 20 persons will at some time be a patient in a mental hospital. Business and industry, by definition, get their share of these mentally disturbed persons. In addition, business and industry often create an environment which is more conducive to mental breakdown, than the preservation of mental health.

What can management do to assist in this problem of employee mental health? Here are three broad activities which can help to create a work environment conducive to mental health:

(1) Watch for characteristics of mental breakdown. Everyone has some of the symptoms of emotional upset —aggressions, fears, changes in mood, anxieties, depressions, frustrations, obsessions, etc. It is only when these symptoms become severe *and prolonged*, that they lead to mental illness. In the psychotic patient, for example, the symptoms have reached a chronic severity, and the person has lost contact with reality (rarely will business see a true psychotic). The neurotic person still has "reality orientation," but shows specific symptoms which indicate lack of personal or social adjustment. These may include: constant tiredness or fatigue, abnormal fears or anxieties, constantly recurring ideas which do not have a rational basis, compulsions (e.g. continuous hand washing), recurring loss of emotional control, the alcoholic, excessive lying, continuous complaints, troublemaking, constant rule violations, continuous requests for special consideration, stealing, flagrant disregard for social standards. When such symptoms occur *repeatedly*, the employee should be referred to the company physician, who will decide whether psychiatric referral is necessary. At no time should company management or the personnel director attempt to diagnose or treat an employee where there is any suspicion of mental abnormality. Also, the earlier such referrals are made, the better psychiatric prognosis for the case. The problem of mental illness should be handled on the same basis as physical sickness, not by methods which create shame or stigma.

(2) Be sure that employees are correctly matched to jobs. This is best accomplished by use of psychological testing techniques, combined with the interview. The interviewer should be aware of the recent developments in non-directive interviewing, and should watch for any gross deviations in the applicant as described above. If a trained personnel technician is in the company or a psychological consultant is used, tests of personality, such as the Rorschach and TAT, can be administered to applicants. One program that can definitely be used by all companies, regardless of their size, is aptitude testing. Aptitude tests will rate each applicant or present employee at a definite qualification level for a certain job (under-qualified, minimum-qualified, well-qualified,

(Continued on page 58)

The Industrial Nurse

Editor
Rosamond J. Webster
R.N., A.M., Ph.D.

Women Workers

According to leaflet 18—1954 released by the Women's Bureau of the U. S. Department of Labor there are over 19 million women in our labor force. This represents about 33 percent of all women of working age, and about 30 percent of all workers. Clerical workers represent the largest single occupational group, and factory operators at various tasks the second largest. These two groups account for nearly half the total of employed women. Apparently, women workers in war industries convinced many employers that women can perform certain tasks previously assigned only to men.

Of significant interest to industrial nurses is the fact that the average age of women workers has been steadily rising—in April 1953 it was 37½ years—and the number of married women both with and without children has also increased. These rising percentages have been tied not only to high marriage rates but to economic pressure.

The employment of these millions of women, with and without young children, poses special problems and should prompt mature consideration by industrial nurses when assistance is needed.

Antibiotics and Tuberculosis

Interest in tuberculosis has been undergoing a rapid change. Reported declines in the death rate from this disease in many parts of the country, plus the use of antibiotics have given many the idea that the job of combating tuberculosis is about done. However, these drugs are being used to help keep more chronic cases alive, and in some communities, there is a reported increase of newly discovered cases. Although ultimate victory over what was once called the White Plague is closer, much remains to be done, chiefly the finding of unknown cases.

In the past five years the treatment of tuberculosis has changed as a result of the rapid development and use of antimicrobial therapy and chest surgery. Surgery is now considered suitable for many more patients. The introduction of streptomycin in 1947 has speeded the development of tuberculosis antimicrobial therapy. It was soon followed by PAS (para-aminosalicylic acid), and late in 1951 by the nicotinic acid derivatives. These and other drugs in various combinations have become very popular. For example, it was found quite early that when streptomycin was used alone, resistant organisms might be recovered in the sputum several weeks after the start of the treatment. The addition of PAS delays and reduces the evidence of such resistance.

But, as we have learned by experience, we must still try to find cases of pulmonary tuberculosis in the early stages and start treatment at once in most instances. Hospital care and bed rest are still necessary at some period for every patient with active tuberculosis. This is the opinion of medical leaders in the field of tuberculosis. If people ask the industrial nurse for advice, she should reinforce these opinions.

A Tribute to Industrial Nurses

So often do we present the industrial nurse with problems and challenges to do a still better job, that it seems desirable to quote a tribute to all industrial nurses who labor devotedly to serve their fellow workers in industry.

This tribute, incidentally, comes from across the border in Canada. The Chairman of the Industrial Health Committee of the Health League of that neighbor country, writes as follows:

"We who are associated with industrial medicine are well aware of the value of the industrial nurse. No health center (industrial) could function efficiently without one. Industrial Nursing is to a large degree practicing preventive medicine. The majority of visits made to a health center in any company are for the most part, the common cold and its complications. This is followed by that great number of individuals emotionally disturbed or frustrated, not necessarily by their

occupation, but for the most part by family matters, namely problems of the home, of marriage, of financial insecurity and of inadequate housing. It is at this particular time that the sympathetic and understanding qualities of the industrial nurse do so much to create good relationship between employer and employe, for she, in her own diplomatic manner, counsels with them, and they learn through her that the company is vitally interested in their health and welfare. Perhaps through her multiplicity of duties she would be better qualified with previous experience in nutrition, psychiatry, and public health. But regardless of all qualifications she may possess, her one essential asset must be her liking for, and ability to get along with people."

These observations by a well-known Canadian industrial physician well portray the place and opportunities of the industrial nurse. She does much that does not go into annual reports; she has the confidence of many. Her opportunities for service to her fellow man are almost unlimited—truly an enviable position.

Heart Attacks—And Recovery

STATISTICAL data compiled by a large life insurance company throws interesting light and presents a hopeful picture on the effects of heart attacks. The majority of victims of heart disease recover from their initial attack, but little information is available on their survival record. The insurance company recently completed a study of white men insured as standard risks who became disabled by heart disease but who subsequently recovered sufficiently to be considered able to return to work. The men studied recovered from their disability from 1925 to 1949, and were traced to 1952. In general, the results show that those who are able to resume activity have a good chance to live for many years.

The best record was made by men in the arteriosclerotic group without a history of coronary occlusion. About 85 percent of them were living at the end of 5 years and 70 percent were still alive at the end of 10 years. Even in the groups with a history of coronary occlusion, nearly 80 percent survived at least 5 years. Those with arteriosclerotic heart disease had a somewhat better record of survivorship than those with valvular heart disease even though their average age was appreciably higher. The experience of those with hypertensive heart disease was not very different from that of men with valvular heart disease.

The overall results of the study indicate that resumption of activity by persons with heart disease is often practicable. A prime obstacle to the rehabilitation of cardiacs is their fear that work will be hazardous for them. Actually, these studies seem to indicate that under good medical supervision a large proportion of patients with heart disease can resume work and activity suited to their physical capacity and, by so doing, benefit both physically and psychologically. This is of considerable importance when we give thought to the increasing average age of our population and the number of men and women reaching the seventh decade of life and beyond. The industrial nurse can be a bearer of good news and effective advice to those who have had heart attacks. This is especially important in those instances where continued work may be an economic necessity for the individual.

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The Troubled Worker

SOME workers who come to the attention of the plant physician can definitely be regarded as problems in industry. There are many causes behind the aberrant behavior pattern.

Dissatisfaction arising within the individual from any of these number of causes may make him a chronic fault-finder. He finds everything wrong in his work. The real difficulty, however, is that he feels things are wrong within himself but projects his personal troubles upon his work and those with whom he comes in contact, whether supervisors or fellow workers. An individual who has marked feelings of inferiority and inadequacy may overcompensate by trying to bully others. This is a common characteristic among children and adolescents, and often carries over into adulthood. The ability or even the effort to dominate and upset others

makes such an individual forget his own feelings of inferiority and insecurity, and helps him to forget his own troubles. Others who feel inferior may merely develop a state of overdependence and look to their superiors and even fellow workers to decide all matters for them. These are the individuals who are personalities who have never grown up emotionally and prefer to have someone to mother them.

Where production is concerned, it is essential to recognize that poor work—inadequate in quality and quantity—is not always due to unsatisfactory working conditions, or lack of competence or intelligence on the part of selected workers. The psychological factors play an important part in such situations. The troubled worker—the one who has an inferiority complex, or is emotionally immature, or faces some severe personal or family problems—will inevitably show the results of these troubles in his work record, absentee record, and adjustment. Looking for the troubles and trying to be of help opens a wide field of service to the competent and adequately trained industrial nurse.

Jobs for Diabetics

Industries which require routine preemployment medical examinations will inevitably aid in the discovery of individuals with diabetes, often where there is no prior knowledge of the disability. Of course, those plants in which such examinations are not made, or where urine examinations are not included, may hire diabetics without knowing they are doing so. The question often arises as to whether or not it is safe to hire such persons. If they are hired, are there any restrictions that should be placed upon them insofar as specific occupations are concerned?

A recent article in the Journal of the American Diabetes Association deals with the problems. It is noted that the proper placement of the diabetic in industry depends upon cooperation between the industrial physician and the personnel department. Many large industrial organizations will employ a diabetic, but will place him in a non-hazardous job. When a veteran employee develops diabetes, he usually retains his job unless it is hazardous to himself or to the public. Studies seem to show that the work record of diabetics in industry is generally satisfactory as compared with non-diabetics. Workers who become diabetics when already employed only seldom need to change jobs. Retaining them at tasks at which they have been trained and in which they are experienced is considered to be good management.

A guiding principle in the placement of a diabetic is that he should not be in a position where, as a result of insulin reaction, he would endanger the lives of others as well as his own. Now, from the point of view of the industrial nurse, if she is aware that a worker is a diabetic and requires regular insulin treatment, she may be of much help by advice, guidance and alertness for the possibility of an insulin reaction. She can be of particular help in the case of ignorant or willfully careless workers who do not stick to prescribed schedules of insulin injections. Literature on diabetes is available from various public and voluntary health agencies. A supply should be on hand in the medical department of every industrial plant.

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(For full details, use Key # T-16 on free Inquiry Card on page 71)

The Oldsters

It is interesting to note from the data published by a large life insurance company that a relatively large proportion of men past 65 are still actively at work after they have reached this arbitrarily fixed retirement age. In all age groups those employed in industry far outnumber those in agriculture, but as the older ages are reached the proportion engaged in industry decreases while that in farming rises.

Contrary to the general impression that age 65 usually marks the end of productive life, fully three-fifths of the men at ages 65–69 are still employed. The proportion is almost two-fifths at ages 70–74, but drops to one-fifth at ages 75 and over. For women, the corresponding proportions are understandably much smaller. During the most productive years of life—under 65—about 90 percent of the men in the labor force are engaged in activities outside of agriculture. At ages 65 and over this proportion falls to about 75

percent, reflecting a relatively greater withdrawal from industry than agriculture. Among those who continue in industry past the threshold of old age, wage and salaried workers decrease in relative importance while the self-employed account for an increasing proportion of the total.

The influence of economic need in keeping older people at work is evident from the data. All through the older ages the proportion working is much higher for married than for single men. Among the women the situation is the other way around, because many of those who remain unmarried have to support themselves. Although the average age at retirement, according to Social Security records, is about 69 years, people who reach that age still have an expectation of life of about 12 years. Careful planning is needed to make suitable provision for this terminal period. Advice from suitable sources can be of much help to oldsters exceeding the "three score years and ten" life span.

Impaired Workers

Only about a third of the State Workmen's Compensation acts contain specific provisions for tiding a permanently impaired worker over a period of vocational rehabilitation. Some laws, such as the one in Arizona, permit the State Commission to make any awards that may be necessary to rehabilitate the injured worker for useful employment. The Wisconsin act permits full compensation payments up to 40 weeks during the rehabilitation training course. Such payments are in addition to the scheduled amounts payable for the impairment. Under the Wisconsin law, payment for the necessary maintenance and travel costs is also permitted if the training is away from the worker's place of residence. Further, compensation payments are not limited as to time while the worker is being trained in the use of artificial members.

But, as a rule, State laws providing for benefits during the rehabilitation period impose specific, and less liberal, maximum limits on the amount of compensation or period of weeks. Arkansas, for example, allows up to $400; Minnesota 25 weeks; Mississippi $10 a week for not more than 52 weeks; Ohio $20 a week for not more than 52 weeks. For some years Rhode Island has provided a curative center to make available to injured workers "all possible modern curative treatment and methods"—following the plan of some Canadian Provinces. In 1951, Ohio authorized its industrial commission to advance up to $300,000 to Ohio State University to establish a rehabilitation center which is now in operation. Oregon, Washington and Puerto Rico have similar systems.

In two-thirds of the States the task of rehabilitating a permanently disabled worker is left to public or private agencies. In many instances, it is up to the disabled worker or a social agency to take the necessary action. The industrial nurse should know the law of her state and keep an up-to-date file of agencies and institutions that can be called upon to assist impaired workers in rehabilitation.

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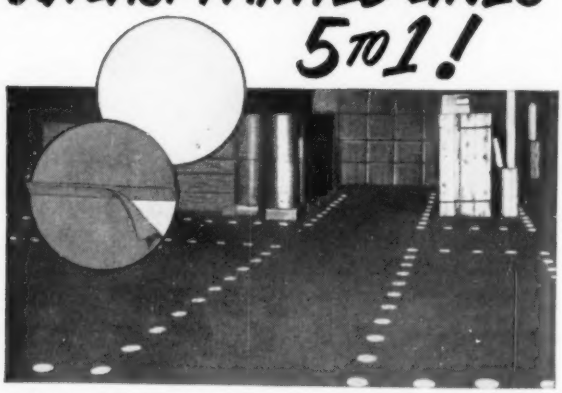

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Whose Job Is Accident Prevention?

Advocates of early workmen's compensation laws held that automatic payments to impaired workers would create a safety consciousness on the part of employers and lead to effective accident prevention. They believed that self-interest would prompt an employer to prevent accidents because by so doing, he would save money. According to a report of the U. S. Department of Labor, subsequent developments have demonstrated that, in the main, this anticipation has not been fully realized. A substantial number of large employers, over the years, have developed comprehensive safety programs. But workmen's compensation costs have been only one of several considerations. Relatively few plants have adequate safety programs. While estimates of the number of workers protected by such organized methods are only moderately accurate, it is believed by authorities in the field that not more than about one-third of all workers are subject to planned, organized safety efforts. As a consequence, our injury toll in industry during 1952 was over 2 million disabling injuries, with an estimated direct economic loss of 206 million man-days—enough to

provide full employment for 687,000 persons per year.

Most workmen's compensation administrations readily agree that accident prevention is better than compensation, but relatively few can do much about it. Some have no such authority; others lack the necessary funds. Still others believe that safety is not their concern. Considering the various negative factors and the high incidence of accidents, the entire matter cannot just be left in a void. All agree that something must be done, but how, and by whom?

Here we come again to the several thousand industrial nurses who are employed in comparatively small plants, without full-time medical directors, without trained safety engineers. They are often in the position to institute effective health education, and safety education falls naturally into that category. By conscientious effort, they can at least stimulate greater interest in both health and safety in their own plants. Many are doing so already; others might well get on the job too.

Women and Accidents

STATISTICAL DATA COMPILED BY A LARGE INSURANCE company indicate the heavy toll of life that accidents take among women. In the United States more than 22,000 women at ages 15 and over die each year as a result of injuries sustained in accidents. Even in the age-range from 15 to 64—before the infirmities of age begin to play an important part in mishap—the annual toll is about 10,000. More women at these ages die from accidents than from any other cause except the cardiovascular diseases and cancer.

Only one-quarter of the fatal accidents among women under 65 occur in and about the home. Motor vehicle mishaps constitute the major hazard, accounting for more than half of all accident fatalities among women. Public places other than streets and highways are the scene of almost all the remaining deaths. Although, as pointed out in these pages, many millions of women are to be found in our labor force, with large numbers engaged in factory work, few are killed in industrial accidents. Less than 1 percent of the fatal accidents among women at the main working ages of life arise out of or in the course of employment. This certainly speaks well for the care exercised in industry to protect female workers, and the parts played by architects in planning workplaces, supervisors, safety engineers, and medical department personnel.

However, the huge waste of life in non-industrial accidents is a challenge to all who work closely with women in industry. It is especially a challenge to industrial nurses. By the use of the figures mentioned in this article, other data, charts, posters, and similar educational materials, the effort should be made to carry the safety message periodically to all workers, both men and women. The effort along educational lines, will be well rewarded if a life is saved, or a serious injury is avoided.

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Principles of Occupational Medicine

STANDARDS OF MEDICAL PRACTICE IN INDUSTRY ADOPTED by the American Medical Association are of interest and concern not only to physicians but to industrial nurses, safety engineers, administrators, and employers as well. According to standards set up by the Council on Industrial Health with the help of the Industrial Medical Association and other medical groups, occupational medicine is concerned with all aspects of health in relation to occupation.

Industrial medicine is a component of occupational medicine provided to employed groups by an employer or by a third party with a valid interest. The broad purpose of industrial medicine is the promotion of the healthful well-being of employed persons through services provided at the place of employment or at another convenient facility or location. This purpose is served by: (1) prevention of disease and injury through medical supervision of workers, the work place, materials, and processes; (2) constructive measures such as medical examinations, counseling, and health education; and (3) medical and surgical care to restore health and productive capacity as promptly as possible after occupational illnesses or injury. An adequate industrial medical program requires the services of licensed doctors of medicine full time, part time or on call, depending on the size of organization, location, potential dangers in

the work environment and other considerations.

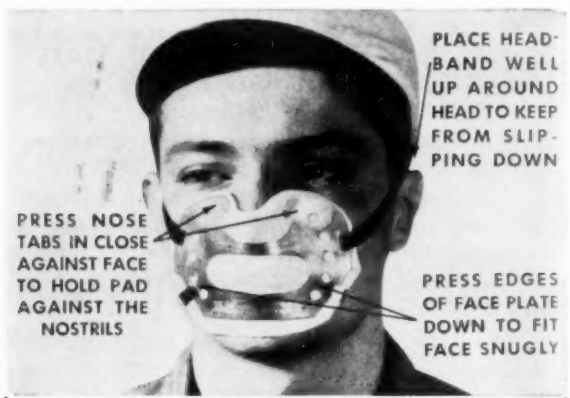
Personal medical services involving the establishment of a diagnosis and the definition of treatment or the performance of specific preventive measures are the function of the physician. However, it is desirable for the nurse to participate in such services if she acts under direct medical supervision or indirect supervision such as is provided by standing orders. These are defined as a written compend of directions, approved and signed by a licensed physician and acknowledged by him to be services and procedures that may be performed by a certain nurse under certain circumstances.

Employment of Handicapped Workers

GIVING JOBS TO WORKERS WITH VARIOUS PHYSICAL handicaps presents a number of challenges to employers, their hiring agents, and medical and industrial nursing personnel. It is understandable that a worker who has suffered an impairment because of serious injury will receive consideration by his own firm. The same often holds true for those who have had a severe illness in no way connected with their employment. But what of others? Many potential workers, physically rehabilitated, have never held a job, and yet need remunerative employment.

A writer in the International Labour Review points out that, in spite of the progress made in promoting job opportunities for impaired workers, much remains to be done in educating employers, the trade unions, and the general public regarding the abilities of handicapped workers. Management, foremen, industrial physicians, placement personnel, as well as fellow workers, need to be brought into the picture of understanding. Handicapped workers have a distinct place as members of the productive labor force. However, considerable knowledge of industrial and commercial work processes, as well as adequate rehabilitation and training are essential if job placement is to be accomplished.

In areas of the country where labor shortages appear, it is especially desirable to give thought to the suitable use of local handicapped individuals. They generally become faithful, efficient, and loyal workers, with high records in attendance and competence. Sometimes, they may require specific advice from plant physicians and industrial nurses. Understanding of the emotional drive of the handicapped worker to succeed on his job and appreciation of any specific physical problems he faces are vitally necessary on the part of the industrial nurse.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(For full details, use Key # T-19 on free Inquiry Card on page 71)

Employee Mental Health

(Continued from page 52)

best-qualified, over-qualified). Mental health is maintained by placing employees on jobs for which they are well-qualified or best-qualified. Placing an employee on a job for which he is psychologically under-qualified leads to frustration and various other types of stress which disturb his mental equilibrium. The over-qualified employee is in equally as bad a position, in that he has too much potential for the job to absorb, and this loss of challenge eventually breaks him down mentally. An applicant who is in good mental health on entry into a company can break down, under the stress of job misplacement.

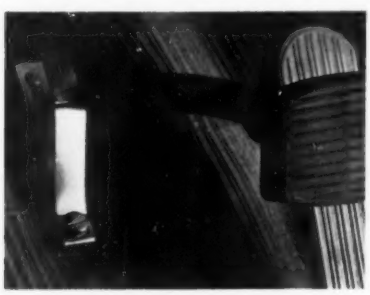
(3) Employees must receive recognition and status. Employee morale and motivational studies have shown that factors such as job security, type of work, recognition, known status in the company are basic employee drives—in fact, rank above salary. Psychological techniques are available to companies for carrying out systematic and objective programs to achieve these goals. These include merit rating, with particular stress on the supervisor's review with each employee of his progress every six months; and morale surveys, which provide an index of employee attitude toward his job and the company. Such programs are an essential to maintain and preserve the individual mental health, even of the well-qualified employee. Such programs also indicate the incipient trouble areas in the employee group, before these symptoms break into full-blown neuroses.

Further information on psychological programs for the maintenance of employee mental health may be obtained from Industrial Psychology, Inc., Research Center, Tucson 6, Arizona.

TRANSPORTATION SAFETY

BRAKE SAFETY-SWITCH

A NEW DEVICE TO HELP CUT THE mounting traffic toll is now on the market from the Rite-O-Way Products Company. The device is a brake safety switch that automatically sounds the car's horn to warn pedestrians and motorists if the brakes fail suddenly. In addition, the switch sounds a warning to the driver if his brakes get low. When the brake adjustment falls below the police standard of safety the driver is automatically informed as the pedal sinks and activates the switch.



Engineered and tested for durability, the device is made of good quality spring steel, and is equipped with 5 feet of wire. It is easily installed in 5 or 10 minutes on any vehicle, the manufacturer reports. The inexpensive device has been enthusiastically received by many safety organizations and is presently being installed on one company's cabs in Detroit.

For further details, use Key #TS-4 on free inquiry card on page 71.

Highway Heroism

AN EMPLOYEE OF THE GEORGE F. Hazelwood Company of Cumberland, Md., who stayed with his blazing concrete-mix truck when the brakes failed on a downhill run to

(Continued on next page)

A deathless Memorial Day results from

TELEVISED SAFE DRIVING AT FORT MONMOUTH

SAFE DRIVING DEMONSTRATIONS were televised over all of Fort Monmouth the day before the Memorial Day weekend, as 11,000 troops viewed precautionary and safety measures to be taken on the road. Live telecasts, initiated by The Signal School's closed circuit TV system, in use for the first time on a large scale program, carried 4 shows put on by a leading insurance company.

During the day, officers and troops of the command assembled in post theatres and auditoriums and watched on standard movie screens insurance company representatives demonstrate safe driving practices. Two cars, specially equipped with stop lights, timing devices, a public address system and other accessories were used. Military personnel also watched the shows from some 30 other receivers around Fort Monmouth.

The safe driving demonstrations, staged for the first time on television, alerted all drivers and riders against the heavy traffic facing them over the long Memorial Day holidays from early Friday evening to reveille Tuesday morning.

The demonstrations pointed out bad driving practices on roads and highways, the methods of entrances and turns into highways, minimum stopping distances at various speeds, and other safe driving measures. The cars were rigged with such items as pistols which fired automatically at points of speed and halts, and other gear which supplied proof of the

drivers' actions. Incidentally, the cars were driven by Fort Monmouth personnel.

The successful telecast was made from a roof top, using 2 cameras equipped with 3 lenses shooting the action on the road below. Banners with safety slogans were up at the gates and hand-outs carried slogans, "Memorial Day Weekend, Don't Be a Memory.—Drive Safely."

It is to be noted that in the last 2 and one-half years over big holiday weekends, there have been only 2 serious accidents involving Fort Monmouth personnel, and no fatalities.

When personnel returned to the post Tuesday, it was discovered that only two minor accidents involving post personnel had occurred over the holiday week-end. The televised driving show was a success by that most important of audience ratings —auto fatalities.

Picture Credit: Signals Corps, Photo.

Highway Heroism

(Continued from preceding page)

steer it safely past children at play has been honored for his heroism.

Floyd P. Carroll, the father of three children, was driving a fully loaded concrete-mix truck on July 9, 1951 when the cab became engulfed in flames as the truck was descending a steep grade in Frostburg, Md. Carroll tried to apply the brakes as the truck gathered speed, but they wouldn't work. Groups of children were playing on sidewalks and in yards several hundred feet ahead of the truck, and Carroll realized the lives of the children would be endangered if he abandoned the truck immediately. He remained with the flaming vehicle till it was well past the children before he leaped from the truck—his hair and clothing on fire. The truck then veered into a small house and was burned completely within a few minutes. Witnesses reported that by staying with the truck and blowing the horn Carroll also made it possible for a woman to escape from the house before the truck veered into it and set it on fire.

1953 Auto Toll Is Worst Yet!

THE WORST AUTOMOBILE ACCIdent toll in the nation's history —more than two million casualties —was recorded in 1953, according to figures released by an insurance company. Traffic deaths totaled 38,500, an increase of 900 over 1952. The injury count reached 2,140,000 compared to 2,090,000 for the previous year.

Excessive speed was the most dangerous driving mistake in 1953. Speed killed 13,870 persons and injured more than 600,000. Week end crashes accounted for 15,800 killed and 800,000 hurt. The pedestrian record reflected the third consecutive year of improvement. The figures show pedestrian casualties reduced by 50 to 8,600. Crossing between intersections, "jay walking," still is the chief cause of pedestrian deaths and injuries.

The report also indicated that 3 out of 4 auto accidents happened to passenger cars driving in clear weather on dry roads; 80 percent of vehicles involved in fatal accidents were traveling straight ahead; Saturday was the most dangerous day of the week to drive; and 1953 was the fourth consecutive year of increase in the death toll.

And the '54 Toll? . . .

ALTHOUGH THE ESTIMATED NAtionwide traffic death total took a turn downward during the first quarter of 1954, indications are the number of injuries has been rising steadily, says Hathaway G. Kemper, insurance company executive.

"The whole question is more serious than automobile statistics usually seem to indicate. The long established idea that fatalities are a barometer of nonfatal injuries needs reexamination. The number of persons involved in each automobile accident has been rising steadily."

Solution of the traffic problem depends on the attitude of the individual motorist, Kemper asserted. "People can't drive recklessly and discourteously in high-powered cars, attempt to fix traffic tickets, pride themselves on the speed of their new automobiles and at the same time expect reduced deaths and accidents," he said. "Drivers must face up to the reality that individually avoiding automobile accidents consists in listening to the voice of conscience and publicly supporting law enforcement."

Kemper called for rigid law enforcement, strict driver licensing, uniform traffic regulations, engineering of safer streets and highways and good financial responsibility laws.

Time for a Check-Up

THERE WILL BE MORE AMERIcans in more cars traveling more miles this summer than at any time in our history, said J. T. Outlaw, executive vice-president of the North Carolina Motor Carriers Association, Inc., as his organization urged motorists to have a checkup on their vehicles.

Commercial motor trucks, Mr. Outlaw continued, travel 5 to 6 times as many miles as the average passenger car. They operate under unique driving conditions, hauling an enormous amount of freight, and maintaining a delivery schedule that Americans have come to rely on. Motor trucks are able to maintain this high standard of service along with longer life per vehicle service and repair.

The trucking official pointed out that before a motor truck is allowed on the highway it is checked thoroughly by skillful, competent mechanics who have gone through months of factory and shop training. The commercial trucking companies know that motor vehicle checkup has no season.

Mr. Outlaw suggests a voluntary 10 point check-up by all motorists on the following parts before every trip: Brakes, tires, front and rear lights, steering, exhaust system, gauges on dashboard, floor mats, windshield wipers, rear view mirror, and condition of glass.

Drivers Too Complacent?

SPEAKING AT THE 15TH ANNUAL Southern Safety Conference, Thomas N. Boate, accident prevention department manager of the Association of Casualty and Surety Companies, said drastic steps must be taken to curb the "typical attitude" of the driving public which has resulted in more than a million Americans being killed by automobiles in the United States since the turn of the century.

"As a driving public we are, first of all, selfish to the point of ruthlessness," the speaker said. "The manner in which the automobile is used, or perhaps better stated, misused, in America today is, by my book, one of the cruelest and most blatant expressions of arrogant mass selfishness of which mankind has ever been guilty. This driver attitude is a typical attitude. It is of small concern to me how, as a people, we got this way. I am concerned over its effects and I am concerned over our failure to take drastic steps to curb it."

Lulled Statistically

Mr. Boate asserted that Americans are "an indifferent, complacent, nonchalant and utterly-thick-skinned people about traffic accidents. As curiosity seekers, we stop to witness the horrible and bloody results of a traffic accident, learn no lesson from it, return to our cars and go whizzing away. We are lulled by the statistical boondoggling constantly being published to the effect that the accident experience is really getting better. Sure, the statistical whitewashers say, we might be killing more people every year; but on a rate basis, with motor vehicle mileage also going up, the average really shows an improvement. So we go blithely on our reckless way, killing and maiming in ever-increasing numbers, damaging and destroying property to an ever-increasing cost."

Mr. Boate charged that while the continuous threat of war has kept Americans "sitting on the edge of their seats, few people are really concerned about what the automobile does on the home front, or of reducing the death and injury toll and the annual economic loss of about 4 billion dollars per year in traffic accidents, although they talk a great deal about the national budget and hope that their tax bill will be reduced. I doubt that anyone would attempt to calculate the total monetary loss flowing from automobile accidents since the turn of the century," he said. "But popular, unspoken opinion seems to be that we will conserve elsewhere—in traffic it does not matter."

The safety expert pointed out that few Americans "give any special notice" to the fact that the million-plus death toll since 1900 represents more people than have been killed in all the wars in which the nation has engaged. He blamed a mania for speed as a principal cause of the nation's high traffic death toll, and called for expansion of driver education in high schools, improved techniques of educational psychologists, broader utilization of various media and mass education techniques, adult driver education and psychological testing of drivers as steps to reduce the accident toll, but he added that these hopes all hinge on long range benefits and give small hope of preventing accidents now.

"This attitude was not created overnight. But it can be controlled, and in spite of, not because of, our 68 million drivers if necessary. It can be controlled by: The enactment of reasonable, uniform laws, more effectively administered driver licensing procedures, stricter traffic law enforcement by the police and heavy, uncompromising penalties for offenders, broader use by the states of their license revocation and suspension authorities, and lastly, but of fundamental importance, the American public must immediately set up a truly national program of education, with emphasis on attitude development, that will teach the youth of the country to live safely with the automobile."

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*name on request.

(Use Key # T-20 on Inquiry Card on page 71)

How's Your "Pohend"?

IT'S OLD-FASHIONED, BESIDES BEING rude, to call the other motorist blind or shout insults at him. If you want to be really cutting, in the modern way, inquire gently how he got such a low "Pohend."

More and more motorists, it became known at the Greater New York Safety Council's 24th annual convention, are becoming sensitive about their "Pohends"—especially drivers for big fleets, like bus and taxicab companies. Dr. Harold Brandaleone, medical director for the Third Avenue Transit System in New York City, told the convention's industrial health session that "Pohend" was a driver's rating in six classifications which determine his safety or accident potentialities. He said the ratings in each classification, taken together, gave the individual's safety "profile." The system, he said, was developed in the transportation industry along lines that had been established by the United States Air Force in evaluating pilot candidates.

A driver's "Pohend" is made up of the following ratings:

"P" represents general physical capacity or stamina of the driver. Factors considered are age, build, strength, stamina, height, weight, ability, energy, muscular coordination, and function.

"O" represents organic functioning and defects. For instance, mild diabetes not requiring insulin may bring an acceptable rating, but the insulin requirement rates a disqualification because of the possibility of insulin shock. Severe hemorrhoids, which might be insignificant in other employment, disqualify a bus driver because in a job that requires long periods of sitting they could interfere with his working efficiency.

"H" classifies hearing defects and aural pathology.

"E" classifies eye ailments and other visual defects, and involves special vision tests and testing for color blindness.

"N" covers neuropsychiatric conditions, including behavior and character disorders, mental deficiencies, and psychosis.

"D" is the classification of the motorability driver tests. This is scored in the American Transit Association Motorability Test.

These tests, Dr. Brandaleone said, are given to driver candidates and periodically to employee drivers. Drivers are rated in each classification on one of four levels, with 1 representing the highest and 4 the lowest grade. The average for the six headings determines a driver's safety rating, except that a 4 in any classification disqualifies him, regardless of how high he may rate in other classifications.

Dr. Brandaleone said comparison of "Pohend" ratings with accident records had demonstrated the worth of the "profile" system in determining accident potentialities.

Pointing out that the Interstate Commerce Commission's new regulations, which became effective Jan. 1, 1954, require that every motor vehicle operator under its jurisdiction have a detailed physical examination every 36 months, Dr. Brandaleone said: "We feel that our standards for classifying bus operators could apply for all operators in the transit and trucking industries."

Drivers and Expressways

STRAIGHT, wide, modern expressways, with all crossings at grade eliminated, have been engineered to standards which in theory should make them virtually accident-proof, according to the American Petroleum Industries Committee in a recent issue of its "Tax Economics Bulletin." However, it adds, the record of these roads in use has raised the question: "Perhaps our superhighways are being built to such perfect standards that they are encouraging the greatest accident hazard of all—that of speed."

The article points out that eliminating the need for attention to curves, grade crossings and traffic lights tends to lull the average driver into a false sense of security. As the result, the driver either succumbs to "highway hypnosis" or drives at speeds "far beyond those to which he is normally accustomed and beyond which he can safely control his vehicle in case of emergency."

Some of the measures taken to improve the accident rates on expressways include increased patrolling, strict enforcement of traffic laws, elaborate traffic signs and even built-in highway curves.

Better-Policed

The article highlights the fact that a 24 per cent increase in the state police detachment on the New Jersey Turnpike in 1953 was reflected in a proportionate decrease in the accident and fatality rates. While traffic on this superhighway recorded a gain of about 23 per cent over 1952, the ratio of all accidents last year on the turnpike dropped 27.6 per cent and the number of traffic deaths declined 23.4 per cent from the 1952 level.

Other traffic control measures that help promote safety on the New Jersey Turnpike include large neon signs, placed along the northern section of the superhighway. These signs inform motorists of dangerous conditions ahead such as fog, snow, ice or other emergencies. They also carry the message "Drive Slow," which flashes on and off to attract the attention of the motor vehicle operator as he approaches.

Among safety devices being tried on new superhighways is the construction of artificial curves to counteract "highway hypnosis." The Bulletin cited the Ohio Turnpike as an example of a superhighway which will have constant curvatures to keep drivers alert.

The article stresses that "the growing recognition that the human factor—the man behind the wheel—is the primary cause of most accidents is one of the most encouraging trends in the whole field of highway safety."

In the final analysis, "the safe operation of a vehicle depends on the driver. Safe drivers make safe highways."

Stop, Look, and Listen

IN A STUDY OF GRADE CROSSING accidents resulting in death, injury or costly property damage, the B & O Railroad Co. found that most of the drivers were in the 35 to 45 age group. One-third of the accidents were caused by motor vehicles being driven into the sides of trains already on the crossings. In 21 percent of these accidents, the trains were at a standstill when they were hit.

A high percentage of the errant motorists ignored warning signals of various types. 41 percent of the collisions occurred at crossings protected by either flashing lights, gates, bells, watchmen or flagmen. The other crossings were marked by the standard railroad crossbuck or other warning devices. Passenger automobiles were involved in 79 percent of the accidents, while trucks of various types made up the rest. This 21 percent figure for trucks is higher than national statistics that show only 13 percent of motor vehicle accidents involve trucks in all accidents.

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1751 Garfield Street, Danville, Ill.
(In Canada: Safety Supply Co., Toronto)

(For full details, use Key # T-21 on free Inquiry Card on page 71)

It Takes Two To Have a Collision

THE CHILLING SOUND EFFECT OF two cars meshing into a pile of twisted metal and the vision of torn bodies preambled a message with a purpose by Paul Kramos, safety engineer for the Butler Manufacturing Company. His speech was part of a three-day general sales conference by that company at Kansas City, Mo.

Kramos was seriously concerned over the 39 automobile accidents involving Butler men last year, 43 per cent of which were caused by passing and approaching, 50 per cent at intersections, and 59 per cent by driving too fast for the conditions and assuming the right of way.

The salesmen were reminded that in the last 20 months three men would have been sitting with them if it had not been for tragic automobile accidents which left three widows and three fatherless children. One hit a train, another drove too long late at night and hit a bridge abutment, and the third struck the side of a truck.

"I realize that not all of our accidents are the fault of Butler drivers," said Kramos, "but in every one of those mishaps which involved two or more moving cars, each driver had an opportunity to prevent the accident."

Legality No Help

"Legally only one may be at fault and responsible for damages, but morally every driver in a moving car who did not do his utmost to prevent that accident is at fault. Every driver has a moral responsibility to do what he can to prevent an accident."

Kramos blamed the state of the driver's mind more than road and weather conditions for accidents. Three out of four of Butler's accidents occurred on a clear day and on a dry road. "It proves that we are not as cautious as we should be when driving conditions are favorable."

The safety engineer described an accident to emphasize this point. Within the last few months a driver on a secondary road went through a stop sign and rammed a Butler car which was traveling on the main road. The Butler driver saw the car coming but assumed that it would stop for the sign. It was too late for the Butler driver to prevent the collision when he realized the other driver was not going to stop.

The Butler driver was not at fault legally, but had he taken his foot off the accelerator and pressed lightly on the brake he would have been ready for an emergency stop.

Kramos talked further on the need for courtesy on today's crowded high-speed roads and highways and summed up his talk by hoping that none of the salesmen will be absent from the next sales conference because of accidents.

INSIDE THE TRADE

The American Building Maintenance Company has for the first time extended its complete building service to the Middle Atlantic States with the establishment of a regional office at 545 Fifth Avenue, New York. Michael W. Jacques, who previously directed the firm's operations at its Fresno and San Joaquin, California branches, heads the Empire State operation.

A.B.M. has more than four thousand men and women in its employ for servicing buildings along the Pacific Coast, in Texas and the Rocky Mountain area. Besides the opening of the New York office, other new branches have been opened this year in Miami, Fla., and the Twin Cities of Minneapolis and Saint Paul, Minn. Additional regional headquarters are planned for Boston, Indianapolis, Chicago, Jacksonville, and Montreal and Winnipeg, Canada.

Robert H. Galambos, 601 Forest Street, Bay Village, (Cleveland) Ohio, has been appointed as sales engineer for Ohio, according to a recent announcement of the John B. Moore Corporation of Nutley, New Jersey, specialists in the formulation and application engineering of solvents for industrial process and maintenance cleaning. Servicing of the company's Ohio sales is to be handled from warehoused stocks in both Pittsburgh, Pennsylvania and Detroit, Michigan.

Appointment of G. S. Brown as Assistant Manager of Research has been announced by Plax Corp., Hartford, Conn., originators of plastic bottles and oriented thermoplastic materials. Prior to joining Plax, Brown was active for the past 13 years in the extrusion of plastics for the Wire and Cable Division of Western Electric Co., Chicago.

The Morton Salt Company's disposable dispenser for salt tablets won the Annual Folding Carton Competition's first Award for "Ingenuity of Construction." The competition was sponsored by the Folding Paper Box Association of America.

The same Morton Salt Company Dispenser for Heat Relief Tablets also received a Merit Award in the "Medicinal Products Division," one of three awards given in this category.

Truman Young has been appointed manager for Market Development of Walter Kidde & Company, Inc., Belleville, N. J. fire equipment manufacturers. For the past twenty-one years he has been associated with the Pyrene Mfg. Co., Newark, N. J., and served as its advertising manager. In the newly-created position, Mr. Young will be concerned with promoting and enlarging the Kidde's marketing activities, particularly through jobbers.

Walter Kidde & Company, Inc. has also announced the purchase of all assets of the Alertronic Corporation. In addition to patents, Walter Kidde & Company acquired a factory tested and Underwriters approved ultrasonic burglar alarm and a staff of qualified electronic engineers.

T. Seddon Duke was elected president of the National Fire Protection Association at the fire safety group's annual meeting in Washington. Mr. Duke is president of the Star Sprinkler Corp., Philadelphia, an NFPA member for over 25 years, a member of its board of directors for the past 10 years and as a vice president for 4 years.

Other officers elected at the same time were: 1st vice president, John A. Neale, chief engineer of the National Board of Fire Underwriters, New York; 2nd vice president, Chief Henry G. Thomas, Hartford (Conn.) Fire Department and president of the International Association of Fire Chiefs; secretary-treasurer, Hovey T. Freeman, president of Manufacturers Mutual Fire Insurance Co., Providence; chairman, NFPA board of directors, Richard E. Vernor, manager, fire prevention department of the Western Actuarial Bureau, Chicago.

H. F. Huttemeyer, former director of sales at the L. J. Houze Convex Glass Co., Point Marion, Pa., has been appointed to the newly created post of director of production at the Pennsylvania Optical Co., Reading, Pa., it was announced by Henry Cheatham, president.

A native of Wallkill, New York, Mr. Huttemeyer comes to Pennsylvania Optical Co., with a wide range of experience. He has in the past been sales manager and product manager of the Sun Glass Division of American Optical Co., and general manager of the Good Grooming Products Co., of Detroit. His responsibilities have included sales promotion, advertising, marketing and merchandising for these organizations.

He will be in charge of production throughout the entire Pennsylvania Optical Co., Mr. Cheatham said.

An unusual fire testing service is available to any plant or industry with a special hazard involving extinguishment of fires, especially fires in volatile chemicals, plastics, gases, metals or other substances. The Ansul Chemical Company invites any company with such a hazard to submit its problem. Ansul engineers will then attempt to work out the solution on its fully equipped 7-acre fire test field.

Any company or industry interested in obtaining additional information about this free service may contact Mr. Guise at the Ansul Chemical Company, Marinette, Wisconsin.

The appointment of Gordon L. Wilcox as Sales Engineer for the American Allsafe Co., Inc., has been announced by Lee C. Churchill, General Sales Manager. Mr. Wilcox will be in charge of the Syracuse, N. Y. office at 2704 Erie Blvd. East. The Syracuse office will also act as a regional warehouse and stock many hundreds of industrial safety equipment products. John Zamorski will act as office manager and assist Mr. Wilcox in handling the large industrial territory around Syracuse.

Purchase of the assets of Service Caster and Truck Corporation, Albion, Michigan, by The Colson Corporation, Elyria, Ohio, has been announced by Robert A. Pritzker, Colson president. Both companies manufacture wheeled products including material handling equipment and casters. Acquisition of the assets of Service will make Colson the country's second largest manufacturer of casters as well as a leader in the production of material handling equipment. The purchase of the Service assets places Colson in the power equipment field for the first time.

Mars Engineering, Inc., 375 South St., Newark 5, N. J. has added a new division which will design industrial dust collection and fume elimination systems, according to Albert C. Tess, President. This service provides special design know-how which individual firms may not have.

The Chase Bag Co. has announced the appointment of Donald William Douglas of Stockton, California, as salesman, according to R. R. Koch, Manager, Chase, Los Angeles. Mr. Douglas will represent the company in the Stockton area and in the state of Nevada.

H. K. Porter Company, Inc., Pittsburgh (Pa.), has announced acquisition of Pioneer Rubber Mills Inc., of Pittsburg, California, largest manufacturer of industrial rubber products on the Pacific Coast. The announcement was made by Porter's president, T. M. Evans, who stated that the new acquisition would become part of the Quaker Rubber Corporation, one of H. K. Porter Company's nine divisions. Pioneer manufactures rubber belting, hose, packing and many other industrial rubber products similar to those manufactured by Quaker on the Atlantic Coast.

Dryomatic Corporation, manufacturer of commercial and residential dehumidifiers, has announced the election of Walter W. Bolton as President. Bolton succeeds W. B. Heinz, who will continue to serve on the Board of Directors. Mr. Bolton is a chemical engineering graduate of Rice Institute and the University of Texas. Before joining Dryomatic, he was affiliated with the DuPont Company at its Savannah River Atomic Energy Project.

The appointment of Mr. Wesley W. Wallace as Southwestern Regional Sales Manager has been announced by Scott Aviation Corporation. Mr. Wallace will supervise all sales activity of Scott safety equipment including the self-contained breathing unit for fire fighting and industry, inhalators, respirators and underwater breathing units. The new Southwestern office is located at 6008 Auden Street, Houston 5, Texas.

The Boyer-Campbell Company announces the opening of a branch in Grand Rapids, Michigan at 301 Indiana, N. W. Besides the resident manager, William H. Caugherty, specialists in Safety at the home office in Detroit will be available for consultation on any safety problem.

The Goshen Manufacturing Company, Inc. of Goshen, Indiana, has announced that many important models of its ladders have been tested by Underwriters' Laboratories, Inc., and now carry the U-L approval label.

The Safety Tool Division of Ampco Metal, Inc., 1745 S. 38 St., Milwaukee 46, Wis., has recently announced the appointment of the Max Weiss Co. and Persingers, Inc., as stock distributors of the full line of Ampco Safety Tools.

Persingers, Inc., 520 Elizabeth St., Charleston, W. Va., will cover the entire Charleston area, and the Max Weiss Co., 4822 W. State St., Milwaukee 8, Wis., the Milwaukee area.

Braking Distance Tested

DRIVING REACTION TIME AND stopping distance has been tested by the First Army Safety Section, proving to 30 U. S. Army and Royal Canadian Air Force safety officers and technicians witnessing the demonstration that under no circumstances can a vehicle be halted without first traveling twice the distance of its driving speed.

Wet and Icy

At 20 miles an hour the minimum distance traveled before stopping would be under ideal conditions, 40 feet. On slightly wet pavement, the car after braking would skid twice as far. On an ice-glazed road directly at freezing, which is a road's most slippery point, the car would slide 20 times as far, or 400 feet.

Chalk-Filled Cartridges

Under the direction of Mr. Don Buck, Special Vehicle Assistant to the U. S. Army Safety Director, a Fort Jay Motor Pool Driving Tests instructor, donning a white crash helmet, sped his light Army staff car over the black hard-top road which intersects the Governors Island airstrip. Affixed to the front of the vehicle was a detonator, a mechanism equipped with two yellow chalk-filled blank cartridges.

X Marks the Spot

Rigged to explode at a set time, the report of the first cartridge immediately chalked the road at that spot and the signal of "danger straight ahead." Slamming on his brakes, the driver skidded to a sharp stop at which point the second chalk-marking cartridge detonated. Attached to the detonator during the test was a lanyard cord for distance measuring held by a passenger.

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(Use Key # T-22 on Inquiry Card on page 71)

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*You're invited to request literature and samples.
(Use Key # T-23 on Inquiry Card on page 71)

What's New...

For your convenience in obtaining descriptive literature of products listed here, use the Reader's Inquiry Card. Just write in the code number given with each item. Or send written requests to:

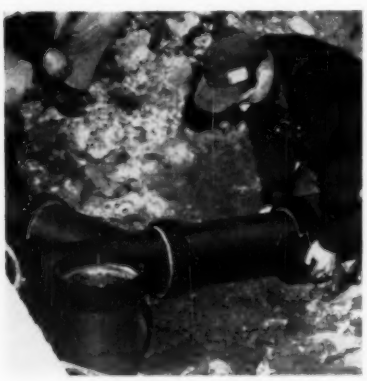
Service Dept.,
SAFETY MAINTENANCE & PRODUCTION

LOW-TOXICITY SOLVENT

(Use Key # 620 on Inquiry Card on page 71)

A NEW low-toxicity safer solvent, suitable for a great variety of industrial uses and cleaning purposes, is announced by Tect, Inc. Called Vythene, it is 1/20 as toxic as carbon tetrachloride, according to the manufacturer, non-flammable and fast evaporating. It may be used for cleaning electric motors and other electrical equipment, plant maintenance, wax dispersion and removal, machinery cleaning, etc.

The solvent is a stabilized 1, 1, 1 trichloroethane, and shows stability for metals including aluminum, brass and copper—even at the boiling point of the solvent. It is colorless, has a low percentage of non-volatile materials, noncorrosive to brass and copper and practically inert to ordinary electrical insulating varnishes and materials.



ACID-RESISTANT PIPE

(Use Key # 621 on Inquiry Card on page 71)

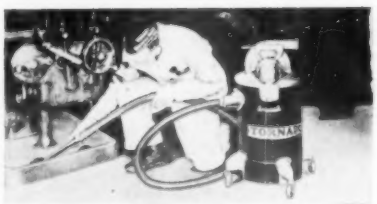
THE need for a reliable and economical drainage system able to carry great quantities of fluids and wastes, and at the same time possessing high acid-resisting qualities, is met by Screw-Seal Industrial Clay Pipe, according to The Robinson Clay Products Co., manufacturers. The pipe and its connections are said to be resistant to most chemicals and gases, including sulphuric acid at any concentration. Installation is very simple; the clay sections screw together with collars. When connections, such as elbows, T's and Y's are required in any situation where space limitations are encountered, a union joint with a split flange collar assures quick and easy installation. The pipe can be strap-hung from ceilings or buried in trenches where joints stay tight and leak-proof despite deflection from frost heave or backfill.

LEATHER SHOE PRESERVATIVE

(Use Key # 622 on Inquiry Card on page 71)

A NEW silicone leather preservative produced by Dow Corning keeps work shoes and leather equipment soft and pliable despite the deteriorating influences unavoidable in many industrial plants. Known as Shoe Saver, the material is a clear fluid which may be easily applied with a soft cloth or swab.

Like other silicone-based treatments for textiles and masonry, Shoe Saver is a water repellent, not a waterproofing agent. It does not seal the pores, but rather coats the individual fibers, permitting treated leather to "breathe." Air is let in; water, oil, and various chemicals are kept out. It also increases resistance to flex abrasion and heat by as much as 50%. Tested in several divisions of a large automobile company, treated shoes showed no oil penetration after 6 weeks, as compared to ordinary shoes which were saturated with hydraulic oils and kerosene after 2 weeks. Seams and stitching that normally broke open in 3 to 4 weeks showed no deterioration. Where shoes and soles exposed to heat dried out and cracked in 4 to 5 weeks, shoes treated with Shoe Saver were still pliable after 6 weeks.

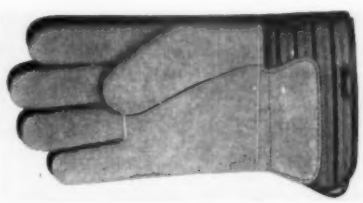


INDUSTRIAL VACUUM CLEANERS

(Use Key # 623 on Inquiry Card on page 71)

THE Breuer Electric Mfg. Co., announces a line of floor scrubbing machines and industrial vacuum cleaners, including heavy duty floor scrubbing machines in 14", 16" and 18" brush sizes.

The Tornado industrial vacuum cleaners have suction velocity of over 300 m.p.h., and pick up oil and water, as well as dirt and metal chips, without conversion. New type attachments and floor squeegees have increased the efficiency of these machines noted for their speed of operation and reduced maintenance time in industrial plant cleaning.



"BREAK IN" ELIMINATED FOR LEATHER GLOVES

(Use Key # 624 on Inquiry Card on page 71)

BY A new tanning process used by the Riegel Textile Corp. leather gloves are pliable and comfortable without a "break-in" period. It is said that the elimination of awkward, finger tiring stiffness during this period benefits worker efficiency. The specially tanned leather is now available for the manufacturer's entire line of leather gloves, including all body types, with band, knit wrist, or gauntlet style cuffs.

SPRAY INSECTICIDE

(Use Key # 625 on Inquiry Card on page 71)

A NEW, quick-killing insect spray called "Bug-Blast," now available in aerosol cans from Huntington Laboratories, Inc., acts instantaneously on moths, silver fish, fleas, flies, roaches, mosquitoes and other crawling and flying insects, and destroys eggs and larvae as well. Its mild and pleasant fragrance makes it ideal for use in schools, hospitals, hotels, restaurants, drug stores, homes, offices, factories, churches, food processing plants, railroad dining cars, public conveyances, etc.

The handy, throw-away aerosol can operates by pressing a plastic squeeze-cap. It's easy to store, always ready for use and requires no mixing or pouring. Some of its active ingredients are pyrethrins, piperonyl butoxide, allethrin and methoxychlor. The spray is non-corrosive, non-toxic, and contains no D.D.T. It is finely atomized and spreads rapidly to reach insects everywhere.

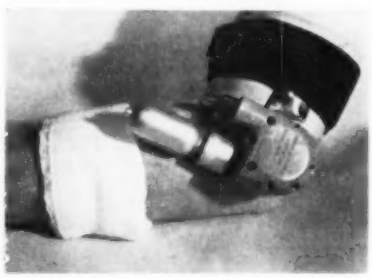
NEW SPLICING METHOD

(Use Key # 626 on Inquiry Card on page 71)

HUGE savings in time are made possible by a new wire rope pressing system that eliminates hand splicing. A worker can make as many as 20 or 30 water-tight splices in an hour. The new pressing system, announced by Jones & Laughlin Steel Corp., employs an aluminum alloy clamp or sleeve that is squeezed around the wire rope in a special 300-ton hydraulic press. Called JalKlamp, the device is used as a mechanical method of splicing eyes, with or without thimbles, in the ends of wire rope. This "splice" gives 100% of the breaking strength of the wire rope itself.

The clamp or sleeve in the new system consists of a piece of metal tubing that looks like a heavy bracelet, oval in cross section, with a place for the two ends of the wire rope cable to be clamped together. The sleeve material is a special non-corrosive aluminum alloy that combines great strength with the ability of cold flowing under pressure—at room temperature. To make a splice, the wire rope is first measured, cut and inserted in the clamp. Then the clamp is crimped or squeezed around the wire. A pressed joint is formed without damage to the individual wires. The clamp metal actually flows into the space between the wires in the strands and between the strands themselves. The clamp becomes a part of the rope.

Jones & Laughlin is leasing special 300-ton capacity motor-operated hydraulic presses to apply this type of terminal to any type of wire rope with any type of center, including fiber. A complete set of dies for different rope diameters up to ¾-inch goes with each press.



AUTOMATIC TOURNIQUET

(Use Key # 627 on Inquiry Card on page 71)

A COMPLETELY new type of tourniquet that automatically and instantly stops the flow of blood and maintains a regulated and uniform pressure is now available. The tourniquet operates by means of a carbon dioxide gas cartridge which, when injected, inflates a cuff to the correct pressure necessary to arrest the bleeding. It was developed by the Robbins Instrument Corp., and the Hi-Pac Division of the Worcester Pressed Steel Co. and will be used by the Armed Services, hospitals, industrial dispensaries, fire and police departments, and as first-aid equipment in many places.

The tourniquet can be self-applied by the injured person simply by wrapping the cuff around the leg or arm, between the wound and the heart. A twist of the cartridge container releases the gas pressure, inflates the cuff and exerts a uniform squeeze to stop the flow of blood. No probing for pressure points is necessary and injury of cell tissue is greatly minimized or eliminated. Weighing only 15 ounces, the tourniquet is easy to carry and built for years of service. The replaceable metal cartridge delivers approximately 10 inflations to the leg and 15 inflations on the arm, and lasts for many hours. The tourniquet has been accepted for advertising in the publications of the American Medical Association.

ALUMINUM LADDER

(Use Key # 628 on Inquiry Card on page 71)

THE Aluminum Ladder Company announces a new line of all-aluminum general purpose step ladders for light industrial and maintenance use. Called the Alco-Lite GP Series, there are seven sizes of the new type folding step ladder from 2 ft. to 10 ft.

Light in weight, the GP Series is especially well suited to quick repair and maintenance jobs and to portable use with motor service fleets. The ladders are made of extruded aluminum alloy, with non-slip grooved steps and rubber feet. Bucket rests are provided on sizes 4 ft. and larger.

ALL-TEMPERATURE PIPE MARKERS

(Use Key # 629 on Inquiry Card on page 71)

A NEW improvement in their line of self-sticking pipe markers, which makes them unaffected by extreme temperatures, is announced by the W. H. Brady Co. Brady All-Temperature Pipe Markers will stick to pipes at continuous temperatures from —300°F to +300°F . . . intermittent temperatures to 450°F.

The markers stick without moistening to bare or insulated pipes, and conform to American Standards Association Std. A-13, with the specific name of the material in the pipe printed in bold, black letters on the proper ASA-specified background color. The markers are mounted on dispenser cards which are treated with Brady's Blue Streak release coating for smooth and distortion free removal. Many styles are available.

INSULATED WATER COOLER

(Use Key # 630 on Inquiry Card on page 71)

THE latest addition to their line of water service equipment, an insulated stationary water cooler and cup dispenser, is announced by the U. S. Envelope Co. It is called the Ajax Insulated Tank, and is designed to provide cold water service for stationary installations in the field.

Among the features of the tank are: corrugated all-steel construction, heavy duty insulation on the top, bottom, and all sides to keep water cooler longer; tight fitting lid to prevent contamination; recessed spigots to eliminate danger of breaking off, help insure positive sanitation and provide drain without spillage; and a special bottom support to hold the tank in shape. Available with a steel, enamel-finished cup dispenser easily attached to the tank for individual cup dispensing.

PLASTIC SHOE COVERS

(Use Key # 631 on Inquiry Card on page 71)

LOOKING like weird "Men from Mars" wearing apparel, new-type canvas shoe covers coated with Geon vinyl plastic are now being used at one of the Oak Ridge, Tennessee, Atomic Energy Commission plants. These covers are worn to minimize the spread of contamination by radioactive materials. Resembling long flapper-type shoes worn by a circus clown, the unique protective devices are merely slipped over the workers' ordinary shoes prior to entering a contaminated area.

Used in the gaseous diffusion plant, one of three main facilities at Oak Ridge, the shoe covers are coated with vinyl plastic by the Flexible Products Co. The coating provides a tough, flexible, abrasion resistant surface to the soles of the canvas covers. The covers do not provide protection against radiation, but by being worn in contaminated areas and then removed, they help prevent tracking of contamination into other areas. Conversely, to maintain certain clean areas, such as hospitals and laboratories, fresh shoe covers may be worn to prevent tracking in possible contamination.

LADDER JACK

(Use Key # 632 on Inquiry Card on page 71)

A NEW, "all-purpose" ladder jack has been developed and marketed by the Allbee & Dunn Metal Products Co. incorporating many new and important safety features and designed to perform many holding and supporting functions necessary in ladder work.

This new ladder jack, known as the "Armstrong" is adjustable to use by width or length from the center, or back and forth on the legs. Ladders can be secured with safety on poles and trees of all sizes and dimensions, on corners of buildings, on flat walls, and two ladder jacks provide a solid platform base for scaffolding.

The jack is constructed of steel, ¼" x 1¼" in width, and is particularly adapted for use by carpenters, painters, roofers, sheet metal men, interior and exterior decorators, construction workers, telephone and light companies, maintenance and repair men and electricians. It is painted a high visibility yellow and safety tips of rubber are used on the legs as a further precaution against slippage.

NEW APRON FEATURES SAFETY

(Use Key # 633 on Inquiry Card on page 71)

DESIGNED for quick removal in case of an emergency, a new safety shop apron called Safepron and patented in the U. S. and Canada, is being introduced by Geo. H. Bowman, Jr.

Available in blue denim and grey acid-proof synthetic fabrics, this bib apron is held firmly in place by a cadmium plated spring wire frame which is easily removed from the garment for laundering. It is particularly suitable for machine operators and other personnel who work with or near moving parts in that it slips off easily if any part of the apron should be caught in the machinery.

EXTINGUISHER CART

(Use Key # 634 on Inquiry Card on page 71)

THIS rubber-tired ball bearing cart, known as the Pull-it, has been designed by Ansul Chemical Company to transport dry chemical fire extinguishers quickly to the scene of a fire.

Particularly suitable for use where fire hazards are dispersed over large areas, the Pull-it can easily maneuver narrow factory aisles. The 30-pound extinguisher mounted on the unit can be equipped with 6 feet of rubber hose, permitting operation of the extinguisher from the cart. The cart is 44 inches high, 16 inches wide and 13 inches deep. It weighs 16 pounds net.

FLOOR RESURFACING COMPOUND

(Use Key # 635 on Inquiry Card on page 71)

A NEW repair and patching compound that makes it possible to repair cracks and holes in interior concrete floors quickly and permanently—with practically no interruption of plant production or materials handling—has been announced by A. C. Horn Division of Sun Chemical Corp.

Called Kwik-Roc and supplied in powder form, the new material is mixed with water, poured into the cleaned out hole or crack, and leveled with the surrounding floor. Normal traffic may be resumed over the repaired area within 45 minutes after pouring. According to the manufacturer, the compound has more than twice the compressive strength of average concrete used in floor construction. Not recommended for use on exterior surfaces; on interior floors that are constantly wet or subject to spillage of water or acids; or for resurfacing entire floor areas.

LIGHTWEIGHT SPECTACLE

(Use Key # 636 on Inquiry Card on page 71)

A NEW metal-framed safety spectacle designed to provide comfort for worker acceptance has recently been introduced by the United States Safety Service Co.

Trade-named the Saf-I-Spectacle, this lightweight spectacle with non-corrosive, nickel silver frame has soft polythene nose pads that mold gently to the contours of the nose and distribute weight lightly without pressing or gouging. Another comfort feature is the unusual lightness. Standard fitting of the Spectacle is the manufacturer's optical plastic lens which has improved scratch resistance and surface hardness. With these lenses, the Spectacle is 30% lighter than the same spectacles fitted with hardened glass lenses according to the manufacturer. A hardened glass Lens is also available if desired. The Spectacle can be furnished with perforated, non-corrosive metal side shields for complete safety on jobs requiring both front and side protection.

ALL-PURPOSE FLOOR MACHINE

(Use Key # 637 on Inquiry Card on page 71)

THE Hillyard Chemical Co., announces the Hiltonian Lowboy, an all-purpose machine for scrubbing, polishing, waxing and steelwooling. This versatile machine combines all the features of a heavy-duty machine for accomplishing every floor

maintenance task and finger tip control makes it easy to operate. Only 8" in height overall, its low design was engineered to fit under desks, chairs, machinery, thus eleminating labor of moving furniture when cleaning—making it extremely efficient for use in schools, hospitals, industrial plants, commercial buildings and institutions.

Twin brushes revolve in opposite directions to pull the cleaning material directly under the brushes, making work go faster and giving complete coverage without unsightly streaks. Interchangeable brushes keep bristles properly upright for longer wear. Among other patented features recommending the Hiltonian for general all-building use are: "Floating Handle" adjusts and stays in any position; "Continuous Duty" motor is set in rubber for quiet operation; one-piece, rust-resistant gear and motor-case protects the motor for lifetime wear; interchangeable 3-gear assembly operates quietly and transmits power easily, doubling the life of each gear; in two convenient sizes, 16" and 19"; four sets of brushes and plates for scrubbing, polishing, steelwooling, burnishing are available.

LOCKING DEVICE FOR PORTABLE SIGNS

(Use Key # 638 on Inquiry Card on page 71)

A NEW locking device called Speed-E-Lok, installed by Eastern Metal of Elmira on its "A" Stand Signs has eliminated a major problem in portable road warning signs. Heavy winds and the air backwash from passing trucks have, in the past, lifted portable signs off their supports causing the stand to collapse shut and fall to the ground. The free-swinging construction and the new locking device enables the signs to "stand-up" under the most extreme wind and weather conditions, air backwash or accidental bumping.

This device consists of a rust-proof cadmium plated lockpin rod located in the top corner of the "A" stand to and through the offset hole in the permanent side frame which slips behind the movable support when the base of the stand is opened. There are no mechanical parts and it is said to be simple and effective. The stand opens in the regular way and automatically locks in place.

NEW PLASTIC WORK GLOVES

(Use Key # 639 on Inquiry Card on page 71)

A NEW line of industrial plastic work gloves has just been announced by the Edmont Mfg. Co. The new line is called Green Turtle and is said to be long wearing. Three styles are available—a palm coated knitwrist, a fully coated knitwrist and a fully coated 12" gauntlet. All are made of full cut, strong fabric liners—coated with a specially compounded, dark green plastic. They are very flexible, have an excellent grip and the fully coated styles are guaranteed liquid proof. The modern coating has outstanding resistance to abrasion and will not chip, crack or peel.

LIQUID ABSORBENT

(Use Key # 640 on Inquiry Card on page 71)

THE Soakup Corp. has placed on the market a new type of absorbent made of calcined aluminum silica. It is called Soakup and, the manufacturer states, will absorb all free flowing liquids in 10 to 15 seconds. Viscous liquids and grease are picked up by brushing the absorbent into the grease.

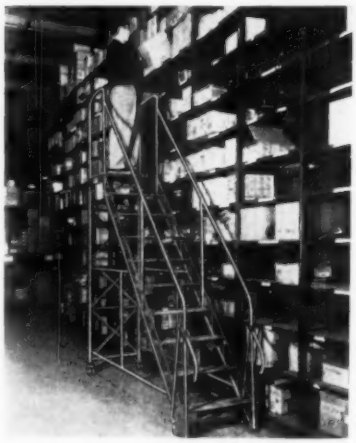
Suitable for oil, water, grease, paint, blood, sugar, rubber cement, acid, and other liquids, the absorbent is said to be entirely dustless and inert. It does not "mud" or pack and can be easily removed from floors or machinery. Approval for use will be granted upon request for Federally inspected food processing plants, according to the manufacturer.

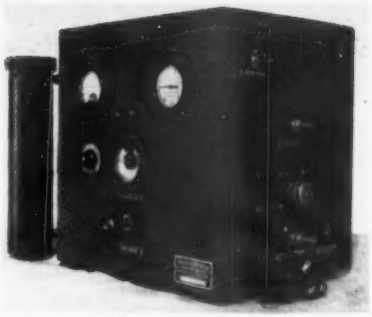
MOBILE STAIR STAND

(Use Key # 641 on Inquiry Card on page 71)

THE R. W. Fieroh Company announces the Handy-Jack portable Stair Stands that offer economical, safe accessibility to high places and take the place of permanent stairways. The Model 90-5W-ten with its 10 standard slope steps is particularly suitable for stockrooms. Profitable use is made of all space on top of bins for storing stock. All sizes and shapes of materials can be handled into racks or bins up to 13 ft.

The standard slope of the stairs permits walking up or down while facing forward and while carrying any size or shape article which can be lifted safely. Step and platform wood, checkered steel or expanded metal materials are available, as well as smaller models and other styles.





CARBON MONOXIDE DETECTOR

(Use Key # 642 on Inquiry Card on page 71)

A COMPACT, accurate carbon monoxide detector designed for garages, mines, factories, chemical plants and similar locations is offered by Taller & Cooper, Inc. The detector is known as Portoco and works automatically, requiring no operator. It is fully portable and may be moved from place to place to spot-check CO concentrations. It may also be installed permanently in one location and used to provide a continuous sampling and analysis.

The device may also be used to control blower systems, and will turn on fans when needed, automatically turning them off when the danger is past. It is also suitable for the protection of personnel since audible and visible alarms may be incorporated in addition to the bright red indication on the dial.

What's YOUR Problem?

- **Has an accident or fire interrupted production?**
- **Want to know how to prevent it?**
- **Do you need background information on equipment for industrial safety, hygiene, or maintenance?**

As a service to its readers, "Safety Maintenance" will arrange to supply manufacturers literature on the following subjects. Just insert the key number on the Readers Inquiry Card on the opposite page and be sure to fill in your name and address. If you need information on a specific type of product, simply write it in on the Inquiry Card.

Key Number	Subject
101	Safety Goggles
102	Face Shields
103	Lens Cleaning & Anti Fogging Equipment
104	Sweatbands
105	Hard Hats
106	Respirators & Masks
107	Protective Clothing
108	Women's Protective Clothing
109	Safety Belts
110	Safety Gloves
111	Safety Toe Shoes
112	Safety Boots
113	Wooden Sole Shoes
114	Anti-Slip Soles
115	Oil-Proof Soles
116	Welding Helmets
117	Welding Curtains
118	Protective Skin Creams
119	Skin Cleansers & Soaps
120	Hand Drying Equipment
121	Sanitary Drinking Cups
122	Athlete's Foot Control
123	Salt Tablets
124	Noise Control
125	Antiseptic Medication
126	Burn Medication
127	First Aid Kits & Supplies
128	Stretchers & Litters
129	Resuscitators
130	Portable Ventilators
131	Dust & Fume Collectors
132	Carbon Monoxide Control
133	Fire Extinguishers
134	Safety Cans
135	Fire Pump Equipment
136	Alarms & Warning Lights
137	Safer Solvents
138	Flammable Liquid Pumps
139	Explosion-Proof Lights
140	Safety Gasoline Tanks
141	Anti-Slip Flooring
142	Anti-Slip Waxes & Finishes
143	Floor Cleaning Products
144	Floor Machine Equipment
145	Oil & Grease Absorbents
146	Paints
147	Ladders & Safety Devices
148	Scaffolds
149	Work Platforms
150	Fluorescent Lamp Guards
151	Machine Guards
152	Power Press Feeders
153	Safety Signs
154	Aisle Marking Equipment
155	Safety Awards & Emblems
156	Employee Safety Guide

TOWEL & OILY RAG BIN

(Use Key # 643 on Inquiry Card on page 71)

A NEW bin designed to provide a practical method for the disposal and replacement of towels and oily waste rags is announced by the J. D. Polis Mfg. Co. Called the Safeway Towel and Oily Rag Bin, one section of the bin is utilized for clean towels or rags. The other section holds the dirty towels or rags. A clean towel is therefore always available in the conveniently partitioned section.

The bin is tubular riveted throughout and reinforced by angle iron using a heavy gauge galvanized iron. Cover closes automatically in the event of fire by means of an Underwriter's Laboratories approved fusible link.

FREE BULLETINS & CATALOGS

As a convenience to executives, these new publications of manufacturers are offered by the Reader Service Department of SAFETY MAINTENANCE & PRODUCTION. To obtain copies write in the key numbers on the free-postage card below.

MEDICAL

Electric Dryers 415
Chicago Hardware Foundry Co. Brochure describes floor and wall model hand and hair dryers. Points out how equipment reduces washroom maintenance by eliminating need for paper towels. Dryers have an automatic shut-off feature. Also shown are electric dryers for boots, goggles, gloves, and other industrial uses.

Burn Ointment 416
Pac-Kit Co. Folder gives complete information about ointment for fire burns, electrical and welding burns, friction burns, scalds, sunburn and windburn. First aid practices for many kinds of burns outlined. Non-sticking feature of ointment pointed out.

Protection for Field Personnel ... 417
Medical Supply Co. Insect repellent and poison plant medication discussed in brochure. Packaging information given and it is shown how safety, comfort and efficiency of field personnel may be increased by protecting against insects and poison plants.

Folding Stretcher 418
Medford Mfg. Co. Pamphlet shows folding stretcher and accessories as complete emergency unit. Can be used as splint, and has attachments which allow for traction, permit application of Eve method of resuscitation, and body straps for raising victim out of enclosed places. Uses of unit pictured and explained.

BUILDING MAINTENANCE

Sanitation Work Kit 419
Industrial Sanitation Counselors. Consists of 29 forms to be used in management of an industrial sanitation program. Among the forms are various check lists for current programs and rating sheets for each level of responsibility in the administration of the program. Also contains product rating forms and illustrated suggestions for the maintenance of equipment.

Vacuum Cleaning Equipment 420
Spencer Turbine Co. Bulletin shows several industrial vacuum units, both stationary and portable, and a variety of pictures showing specific uses to which the units may be put. For recovery of metal, chips, etc., cleaning, both wet and dry, and removal of fumes. Machines available with attachments for specific applications.

Metal Stair Treads 421
Wooster Products Inc. 24-page booklet gives detailed information concerning methods of safeguarding stairways by installation of anti-slip metal treads. Accident statistics given; also legal responsibility of building owners. Pictures show how treads may be installed. Also shown are anti-slip walkways and ramps and industrial gratings.

Aluminum Ladders 422
Patent Scaffolding Co., Inc. Bulletin lists lightness of weight, strength, and rust, rot, mildew and corrosion resistance of aluminum ladders. Single ladders, extension ladders and step ladders shown. Specifications of ladders given including anti-slip treads on all models.

PERSONAL PROTECTION

Guide for Hazardous Gases 423
Acme Protection Equipment Co. Folder gives comprehensive list of 433 gases, fumes, mists and dusts in operations where a gas mask should be worn. Included is descriptive information, limits for determining safe working conditions, and listing of the type of canister designed for each specific hazard.

Neoprene Crepe Soles 424
E. I. duPont de Nemours & Co., Inc. 8-page booklet describes a series of tests involving natural rubber and neoprene crepe soles for wear, resistance to oil and grease, resistance to abrasion and resistance to spreading and deterioration. Results of tests, usually administered under heavy duty industrial situations, are clearly shown pictorially.

Eye & Face Protection 425
Glendale Optical Co., Inc. 15-page catalog of a line of hardened glass goggle lenses for impact and glare hazards including welders' lens with a metal coating for reflection of damaging rays, goggles, spectacles, helmets, handshields and plastic utility goggles. Also shown is leather clothing for welders such as sleeves, spats, gloves and aprons.

Chemical Resistant Clothing 426
Chem-Wear, Inc. Acid, caustic and fire resistant shirts, pants, coveralls and aprons subject of catalog. Lightness of weight and great wear resistance featured. Includes splash-resistant garments which do not absorb liquids. Catalog contains table showing performance record of fabric to 61 chemicals in various concentrations.

ELECTRICAL EQUIPMENT

Rubber Wiring Duct 427
Winders & Geist, Inc. Bulletin deals with rubber duct designed for installations where it is necessary to run inside wiring over the floor. Duct is flexible and presents no tripping hazard, and is moisture proof. Can also be used for electrical wiring. Complete installation instructions with schematic diagrams included.

Fluorescent Lamp Guards 428
General Scientific Equipment Co. Brochure describes a resilient steel clamp which locks around fluorescent lamps to prevent falling lamp accidents. Ease of installation, cleaning and relamping pointed out. Various sizes and styles available for many different types of fixtures.

Conduit Fittings 429
Hazardous Area Equipment Corp. 8-page booklet gives technical information and schematic diagrams on a line of conduit fittings for all types of hazardous locations. Fittings carry approval by Underwriter's Laboratories and can be used without the need of installing new systems if the class of

(Continued on next page)

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July, 1954

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Free Bulletins (Cont'd)

hazardous area should change or if a non-hazardous area becomes hazardous.

FIRE PROTECTION

Containers for Flammable Liquids 430
Protectoseal Co. Bench cans, plunger cans, machine bench cans, manual and automatic wash tanks and foot operated dip tanks for use with volatile or flammable liquids pictured and discussed in bulletin. Hinged covers are designed for quick closing and the automatic types have fusible links to close the cover automatically in the event of fire.

Sodium Nitrate Storage 431
Ansul Chemical Co. Technical bulletin explains the fire hazard involved in the handling of sodium nitrate. Ineffectiveness, generally, of smothering type agents pointed out, due to the feeding of oxygen to combustible materials by sodium nitrate. Use of dry chemicals suggested in an emergency until water streams can be applied.

Safety Tanks 432
American Safety Tank Co. A line of fuel tank for vehicles shown in bulletin. Crash resistance, spillproof qualities, and the fact that tanks are non-explosive in fires featured. Available with various accessories and in various sizes and mountings. Schematic diagrams show construction. Approved by Underwriter's Laboratories and meets ICC regulations.

Wet Water Proportioner 433
Accurate Tool Co. Folder discusses portable and stationary equipment which furnishes wet water for class A fires. Operates on water pressures ranging from 20 to 150 lbs. Quickly recharged and put into use when proportioning tank is exhausted. Can also be used with other chemicals such as insecticides and weed killers.

MISCELLANEOUS

Driver Training & Testing 434
Porto-Clinic Instruments, Inc. Catalog of devices and visual aids for over-the-road and in-plant drivers. Includes psychophysical testing equipment for reaction time, depth perception, visual acuity, field of vision and color recognition. Also shown are stopping distance meters, safety awards, traffic slide rules, training boards, etc., as well as series of training publications sent directly to drivers.

Safety Signs 435
Stonehouse Signs, Inc. A complete line of safety signs, conforming to American Standards Association specifications for design and color, shown in folder. Includes signs for all types of plant hazards as well as tags and signs which can be filled in as desired.

Industrial Magnifiers 436
Bausch & Lomb Optical Co. 24-page booklet gives detailed information concerning industrial magnifiers including technical information and instructions as to use. Many styles of magnifiers are pictured and described. Also contains data on microscopes and projectors. A glossary of technical terms included.

Hose Coupling 437
Titeflex, Inc. Quick connect-disconnect hose coupling for water, oil, steam, gas and chemical lines outlined in 16-page booklet. Leak resistance, sealing action as internal pressure increases and swivel action pointed out. Also described are single- and double-check valves for use when lines are disconnected, and a series of accessories.

V-Belts 438
Goodyear Tire & Rubber Co. 32-page booklet contains engineering and design data on multiple V-belts. Includes horsepower ratings and an explanation of the fundamentals of V-belt design. Selection data included. Contains many tables and other helpful data to assist in the selection, installation and service on most jobs where V-belts are used for power transmission.

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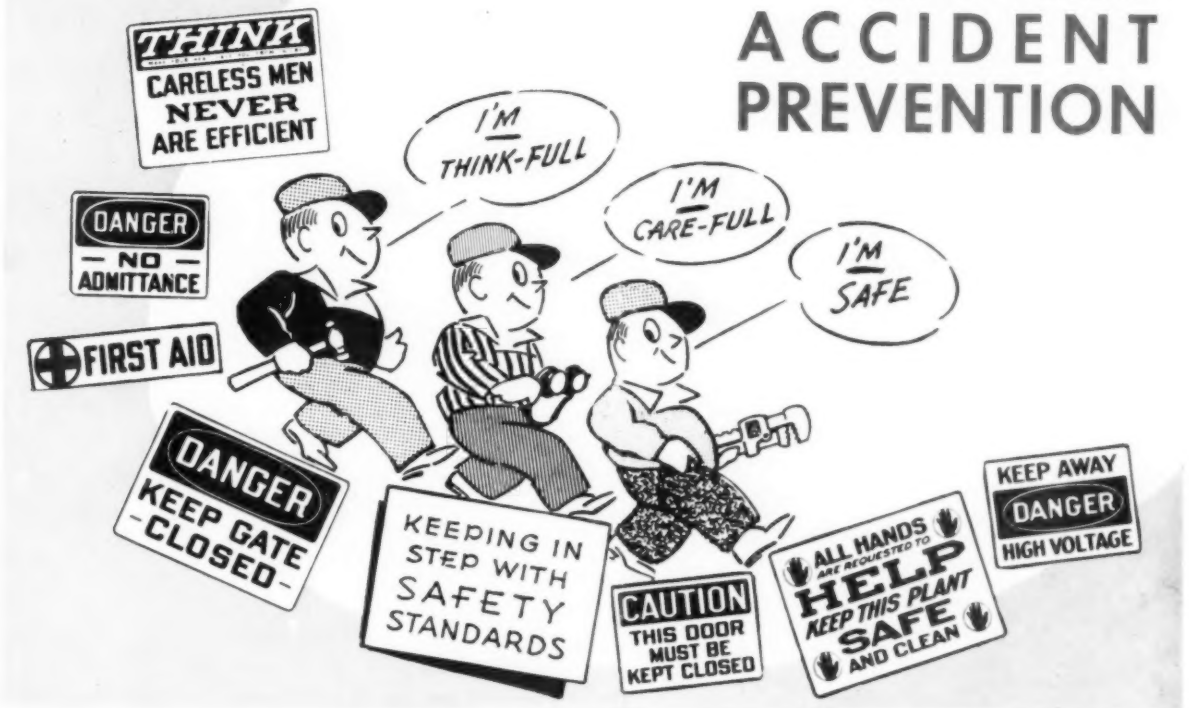
Stonehouse SIGNS FOR INDUSTRIAL ACCIDENT PREVENTION



Safety on the March

Now, more than ever, Safety and Efficiency go hand in hand. Workers in Industry have proved that the safe worker is far more efficient—in higher production and morale.

STONEHOUSE SIGNS

Throughout Industry these signs make a powerful contribution to safe working. They educate, impress, safeguard workers on the job. There are hundreds of Stonehouse stock wordings. Special wordings are also produced to customer specifications.

Our complete Catalog—64 pages, in full color—free on request.

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(For full details, use Key # T-24 on free Inquiry Card on page 71)

MERCUROCHROME®

for first Aid

Neglect may cause infection, which can be prevented by prompt use of Mercurochrome.

No antiseptic has been proved to be more effective than Mercurochrome.

Thirty-four years of extensive clinical and lay use has proved the value of this popular antiseptic.

Thantis **LOZENGES**

First aid for throat irritations...

Thantis Lozenges relieve pain promptly—reduce infection—act prophylactically.

Sore throats due to coughs and colds, if neglected, may result in lost man hours of work.

HYNSON, WESTCOTT & DUNNING, INC., BALTIMORE 1, MARYLAND

(For full details, use Key # T-25 on free Inquiry Card on page 71)